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Prevention Policymaking and Health Systems in Latin America: why and when governments plan ahead

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Tese apresentada ao Programa de Pós-graduação em Ciência Políticada Universidade Federal de Pernambuco, como um requisito parcial para obtenção do título de Doutoraem Ciência Política. Área de concentração: Democracia e Instituições

Orientadora: Mariana Batista da Silva

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I dedicate this to Arthur Conan Doyle, who in the year of 2023 must be so satisfied that we can finally remove Sherlock Holmes from his very dead and unwilling hands and take him places he has never been before, and that he very much deserves. Thanks for hating him enough, Sir Arthur, we'll take care of him now. To the Doyle State, a joke organisation commanded by a bunch of greedy fraudsters, I offer nothing but my sincerest mocking smirk.

AGRADECIMENTOS

Agradeço pelo apoio institucional e financeiro para realização desta pesquisa durante todo o doutorado, com bolsa de fomento à pesquisa, e período sanduíche na Universidade de Oxford: PPGCP-UFPE, PROPESQ-UFPE, CAPES, LAC-Oxford. Isso se aplica às instituições e às pessoas por trás dos nomes.

Vou usar deste espaço para fazer um ode aos perdidos: às vezes no erro encontramos os acertos. O arrependimento logo de cara depois de uma escolha feita por inércia, e os constrangimentos formais impedem de dar um passo pra trás. A afobação em fazer o que é esperado sem parar pra pensar se é o desejado. Você errou e achou uma resposta nesse caminho, então está tudo bem.

Não vou citar nomes porque são muitas pessoas, que nas pequenas e grandes participações, marcam uma contribuição. Vai desde uma porta sempre aberta no departamento, com um conselho e um chocolate de prontidão. Passa por uma reunião semanal de deságua de infelicidade e otimismo misturados. Uma coxinha celebrada de vez em quando entre um bando de desnorteados dando a direção uns para os outros. Pela existência dos amigos de muito longe, ou de muito tempo, ou que só existem por trás de uma tela, que aparecem só de vez em quando e fazem você se lembrar, "ah! Sim, me sinto bem aqui", e está tudo bem se é só de vez quando. É a família que não entende muito bem o que você faz, mas está tudo bem. É a orientadora sempre paciente e gentil quando nem você se aguenta mais.

No cansaço de erros acadêmicos fui cometer erros no mercado de trabalho, uma outra experiência. Levei o que eu tinha para oferecer, e aprendi ainda mais coisas em troca. Uma lição de vida: satisfação e frustração, pessoas incríveis e pessoas desonestas existem em qualquer um desses ambientes.

Escrevendo essa tese me dei conta de que isso é o melhor de mim. O produto de todos os anos, de todas as perspectivas, de tudo diferente que vi passeando pelo Brasil, e pelo (ainda restrito) mundo. Tudo que aprendi está bem aqui. Poderia até ter representado isso melhor, mas sempre pode estar melhor - e portanto nunca será.

Disfarço os problemas com pinceladas de humor (já tem desânimo demais nesse meio). Deixo tudo de mim na tese, para encerrar de vez esse ciclo acadêmico. Tem outras coisas vindo (ainda não sei quais), e talvez eu não seja melhor do que sou aqui, mas está tudo bem.

Will history repeat itself? The answer must be: Yes, it will. A new HIV, a new Ebola, a new plague, a new influenza pandemic are not mere probabilities. Whether transmitted by mosquitoes, other insects, contact with animals or person-to-person, the only major uncertainty is when they, or something equally lethal, will arrive. The obvious follow-up question is: So what are we doing about it? (Organisation mondiale de la santé, 2018, pg. 14)

ABSTRACT

Which political factors lead to prevention as a policy choice? I argue that prevention policy-making happens when the uncertainty of the decision-making environment is minimised, which happens in stable and resilient arrangements. My independent variables are policymaking stability index, fiscal decentralisation and health systems, and I condition their impact to path dependence of the countries institutions and economy. I investigate these associations in a mixed methods approach, by a Convergence Design. I operationalise these variables as continuous indicators in a comparative OLS regression model with error adjustment for seven Latin American countries. I find that decentralisation is the most consistent covariate, compulsory insurance health system models have a small but positive association, and policymaking stability is conditioned by the inclusion of control variables such as quality of government and cabinet ideology. In general, the strongest models are lagged ten years before emphasis in prevention, showing the impact of path dependence. Decentralisation is also a great driving force in my case study of the Dengue Control Program in Brazil, as identified through categorical aggregation of documents and interviews material. Governments' preferences, financing priorities and how they conceptualise prevention over time have been shown to shape how the policy is designed.

Keywords: prevention; path dependence; health systems; political institutions; latin america politics; dengue fever

RESUMO

Que fatores políticos levam à prevenção como uma escolha de política pública? Argumento que a formulação de políticas de prevenção ocorre quando a incerteza do ambiente de tomada de decisão é minimizada, em arranjos estáveis e resilientes. Minhas variáveis independentes são o índice de estabilidade na formulação de políticas, a descentralização fiscal e sistemas de saúde, e condiciono seu impacto à dependência da trajetória institucional e econômica dos países. Investigo essas associações em uma abordagem de métodos mistos, por um Desenho de Convergência. Operacionalizo essas variáveis como indicadores contínuos em um modelo de regressão MQO comparativo com ajuste de erro para sete países latino-americanos. Encontro que a descentralização é a covariável mais consistente, os modelos de seguro obrigatório de saúde têm uma associação pequena, mas positiva, e a estabilidade da formulação de políticas é condicionada pela inclusão de variáveis de controle, como qualidade de governo e ideologia do gabinete. Em geral, os modelos mais fortes estão defasados dez anos antes da ênfase na prevenção, mostrando o impacto da dependência de trajetória. A descentralização também é uma grande força motriz em meu estudo de caso do Programa de Controle da Dengue no Brasil, conforme identificado por meio da agregação categórica de documentos e entrevistas. Demonstro que as preferências dos governos, as prioridades de financiamento e como eles conceituam a prevenção ao longo do tempo moldam a forma como a política é elaborada.

Palavras-chave: prevenção; dependência de trajetória; sistemas de saúde; instituições políticas; política latino-americana; dengue

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LIST OF ABBREVIATIONS

LatAm	Latin America
LMIC	Low and Middle Income Countries
MENA	Middle Eastern and North Africa
NHS	National Health Service
OECD	Organisation for Economic Cooperation and Development
PAHO	Pan American Health Organisation
PEAa	Plano de Erradicação do Aedes Aegypti
PNCD	Programa Nacional de Controle da Dengue
RIC	Rich and Industrialised Countries
SHA	System of Health Accounts
SUS	Sistema Único de Saúde
WHO	World Health Organisation

SUMMARY

1. INTRODUCTION

Which political factors lead to prevention as a policy choice? Preventive policies try to avoid an issue from arising by tackling the roots of said issue. On the other hand, a reactive policy deals with the aftermath, by trying to minimise the consequences of the issue. Prevention is never as prioritised as reactive policies because, among other reasons, it's hard to pinpoint causality of complex social problems and those policies are not as visible for voters.

Reactive and preventive policies are not exclusive - they coexist in a government's planning, and the balance between them varies. Then, when can we expect a government to plan ahead by choosing to implement more preventive policies? My research investigates this in two levels of analysis. At a meso-level, I'll look for **associations between particular combinations of institutional settings and policy structure (which I'm calling policymaking arrangements) and emphasis in prevention**. For a more micro-level of analysis, I want to **identify political driving forces behind a preventive policy choice**.

I opt for health policies as the lens of my investigation, since health is a highly salient area, and its definition of a preventive policy is clearer than most areas. Reactive policies in the health arena are the curative policies. In this very technical area, it's common to try to depoliticise data, and I aim to show in this work how politics is inherent to health policymaking.

My argument, as presented in detail on chapter 2, is that political uncertainty is the main obstacle to intertemporal agreements that formulate and implement prevention policy. Policymaking arrangements, consisting of stable institutional settings and resilient policy structure, have the capacity of minimising uncertainty and encouraging long-term policymaking - and therefore be an incentive to the continuity of policies. In environments where continuity is expected, the emphasis on prevention policies is more prevalent. I also argue for the impact of path dependence on this relationship, since policymaking arrangements carry the memory of the processes responsible for creating them.

My framework of analysis is systematic, meaning that the big picture of policymaking arrangements is more interesting than individual factors. The main mechanisms are stability

and resilience. The indicators for stability refer to actors in direct decision-making arenas, such as party systems, legislatures, and cabinets. From these indicators I build a Policymaking Stability Index - POSTI. For resilience, my indicators frame the policy structure for health: decentralisation and health systems.

For my meso-level analysis, I set hypotheses that look for associations with emphasis in prevention: it increases when there are higher levels of policymaking stability, lower levels of decentralisation, and a national health system. For micro-level analysis there will be no hypothesis testing, but I'll keep the same theoretical categories, also adding variables that are hard to quantify, like interests and ideas.

My object is scrutinised on chapter 3, where I explain how health system models work, and how they are a political product. The three main models are a derivation of welfare state models: National Health System, of free and universal care; Compulsory Insurance, where care is tied to the differences between groups of workers and social class; and Voluntary Insurance, marked by the privatisation of healthcare.

To operationalise emphasis in prevention (and all health related variables), I make use of the international System of Health Accounts 2011, a proposal made by OECD and WHO to permit comparability between countries' expenditures data. My strategy is to use available data that adheres to the SHA, as it fulfills criteria for validity and reliability. Prevention is, then, a continuous variable measured by the ratio between curative and preventive expenditures: when the ratio is closer to 100%, it means there's more emphasis in prevention.

My empirical strategy is to build a mixed-methods approach that reflects the two levels of analysis I proposed, and later I can merge the results of both analyses in a Convergence Design. This is so I can have a more complete understanding of the phenomenon I'm studying.

For the quanti design, I'll use Latin America countries in a comparative study, a group of neglected data in favour of rich and industrialised countries, which may have been creating a constant bias of results in comparative works of the area. Constrained by availability of data, my sample consists of Brazil, Chile, Costa Rica, Dominican Republic, Mexico, Paraguay and Uruguay.

For the quali design, I choose one preventive policy for a case study, The Dengue Control Program in Brazil. While case studies look for mechanisms, not generalisations, Dengue Policies exist in most Latin America countries, including the ones in this study, meaning there's

a good chance of shared experiences between countries in the region existing - especially considering their similar history, also discussed on chapter 3.

The POSTI I introduce in my argument is built using Principal Component Analysis, and the entire process can be found on chapter 4. POSTI is used as an independent variable in my quantitative models on chapter 5.

While it would be ideal to do a time-series cross-section analysis for the type of data I have, my sample doesn't reach the minimum amount of units in time to do that, neither is appropriately balanced. Although I run regular OLS models, I take in consideration the potential auto-correlation in my data, and I try to deal with that by controlling errors in the models, using heteroscedasticity-robust errors and clustered errors. I also use lagged data to test for path dependence.

The case study is presented in chapter 6. Using documents and interviews data, I trace the historical institutional trajectory on the formulation and decision-making of the Dengue Control policy. The method for this analysis is categorical aggregation, using my theoretical variables as reference. Through the ensuing coding, I establish which driving forces I identify in the material, always indicating path dependence factoring in the policy choices.

While the two analyses are conducted separately, they fulfill my one research objective. So, at last, chapter 7 discusses both results using a Side-by-Side Joint Display, at the light of the theory predicaments made right at the beginning, which you will access right now in the following page.

I hope you enjoy the ride.

2. THE BEST MEDICINE: PREVENTION POLICYMAKING IN THEORY AND PRAC-TICE

2.1 Preventive versus Reactive

One of the most basic presumptions of Political Science is that demands are infinite but resources are limited. Policymakers face a myriad of dilemmas when allocating resources, as the emphasis on an issue or agenda usually presents itself as trade-off. A great relevant trade-off for governments is to choose between preventive and reactive policy.

While reactive policy deals with a current problem that needs to be fixed or alleviated, prevention policymaking refers to the strategies adopted to avoid a problem from arising. For example, a reactive policy to a high child mortality rate could be an investment in paediatric hospitals. A preventive policy would be identifying why are young children dying, let's say sanitation deficit to illustrate, and tackling this indicator. Therein lies the conundrum.

There are obstacles to the choice, formulation and implementation of such policies. The three main ones are:

First, identification of the origins of a social issue is generally an ambiguous task, and in many instances the problem itself is too multidimensional to be defined in functional terms. It becomes a scenario of proposing vague solutions to an unclear problem, since a linear cause and consequence chain can't be specified (CAIRNEY; DENNY, 2020). Using the example above, child mortality could be linked to a number of causal chains created by extreme poverty - sanitation deficit, nutritional deficit, lack of access to primary healthcare, etc;

Second, I am forced to return to the allocation of resources dilemma. Even having the sense of the specific prevention policy needed, it ultimately becomes low in priority. When competing for policymaking resources and money, long-term initiatives with no results in sight are hard to sell, especially if there's austerity. This means the short-term high salient public services with measurable targets become high priority (CAIRNEY; DENNY, 2020; JAIN; DUSE; BAUSCH, 2018). It's a more concrete, visible and simpler ordeal to build a paediatric hospital than solving extreme poverty;

Third, decision-making environments tend to be complex, and understanding on them is limited. Benefits to implementing preventive policies happen in the long-term, making it hard to attribute them to a single intervention in the past. Besides, there's no academic or political agreement on how to produce and select the best evidence to pinpoint those causal connections. Policymakers are forced to settle for success based on narrow indicators of outcomes without solving the root cause of the problems (CAIRNEY; DENNY, 2020).

Benefits in the long-term are not exclusive to preventive policies. Investing in the future is a general trade-off against maximising current social welfare. Long-term policies are reached through what we call intertemporal policy agreements or choices (JACOBS, 2016). Future-oriented policymaking depends upon specific decision-making structures and anticipatory knowledge, but the capacity to implement that is limited for individuals, needs, resources and systems. Knowing the future and formalising the policymaking process are hard to connect, as the future is speculative (HEO; SEO, 2021).

Poverty of information about longer-term outcomes is a substantial constraint to policy investments in the future. Information about the past and present already requires considerable cognitive capacity from voters and policymakers alike (ZALLER, 1992; LUPIA, 1994; LERMAN; MCCABE, 2017), understanding of future conditions is way beyond effort (JACOBS, 2016). Preventing an epidemic emergence, for example, would require predicting how much resources should be taken, which is extremely challenging (JAIN; DUSE; BAUSCH, 2018).

Besides, the general population and organised groups of interest have reasons to be sceptical about long-run commitments, as the former don't trust the government to not take the pay without delivering the benefits, and the later may believe they can achieve the same benefits through redistributive alternatives that are less costly to them (JACOBS, 2016).

Despite all the difficulties to implement them, intertemporal policy agreements are considered a goal to be pursued, as they are cheaper and usually come with stability to policies due to the cooperation between policymaking actors to achieve such transactions (SPILLER; STEIN; TOMMASI, 2003; STEIN et al., 2005; SCARTASCINI et al., 2010), and planning for the future creates robust and adaptive policies (HEO; SEO, 2021). And above all, tackling the root of a problem means the population is spared of these issues. As the saying goes, prevention is, after all, the best medicine.

Then, I want to know *Which political factors lead to prevention as a policy choice?*. This is the broader research question.

The conceptual framework I adopt here is that the policymaking process not only matters, but it affects qualities and characteristics of resulting public policies, as they are the outcome of the interaction between political actors (SPILLER; STEIN; TOMMASI, 2003; STEIN et al., 2005; SCARTASCINI et al., 2010). Processes matter to public policies, and only a systemic analysis can fully capture its effects (STEIN et al., 2005).

This is so because of the broad focus I'm going towards. However, policymaking processes are also relevant at a micro-level of interaction, even if it doesn't fully show us the big picture of a policy choice, since the direct mechanisms and motivations behind it are more visible. This would require a laser focal point in specific processes or policies, though.

Preventive and reactive policymaking, and prevention and non-prevention policies, co-exist and sometime collide (CAIRNEY; DENNY, 2020). Applying this systemic framework to prevention, and understanding that implementing this type of policy encounters not only hardships, but also non-trivial political disincentives, I'm splitting my research question in two levels of analysis. At the meso level, **which policymaking arrangements are more conducive to preventive policy?**. At the micro level, **what are the driving forces behind a preventive policy choice?**

2.2   Health *policy* and Health *politics*

The discussed ambiguous classification of social issues poses as a challenge when studying preventive policy, so I opt for the most straightforward approach, which is choosing health policy as my main subject, and I explain why in the following.

Healthcare is shown on literature as the most salient policy area at the local level, making it very likely that any observable effects on healthcare studies are also found in other less visible areas of government activity (TORAL, 2021).

Labelling what's a preventive health policy tends to be a clearer path than most, as the causes and consequences have a more technical language. The System of Health Accounts (SHA) co-elaborated by OECD and WHO offers a systematic classification of healthcare components. It works as a guide for domestic policymakers, so their published information on health systems is comparable internationally (OECD; Eurostat; World Health Organization, 2017). Reactive and preventive policies can be distinguished by applying SHA's healthcare functions classification.

In the health lane, reactive policy is known as *curative care*. All care services in which the focus is to relieve or reduce symptoms of illness or injury, be it inpatient, outpatient or home-based, are designated as curative. *Preventive care* is comprised of services that avoid or reduce the number or severity of injuries and diseases, and their consequences (OECD; Eurostat; World Health Organization, 2017)

Prevention and early intervention are not synonymous, and there are types of prevention. Primary prevention targets the whole population by modifying social or physical environment, with communicable diseases as the main example; secondary prevention pinpoints risk groups, target programs and social policy based on behavioural indicators of risk, like screening programmes for at-risk groups with the intention of identifying disease at the earliest possible stage; and tertiary prevention concentrates on affected groups, intervention to manage chronic conditions, and the social policy can be crisis intervention, example being programmes to minimise the impact of diagnosed diseases (CAIRNEY; DENNY, 2020). Since tertiary care overlaps with other types of health functions, the latest edition of the SHA only considers primary and secondary in the group of preventive care.

One of the components of a health disaster[1] cycle is prevention, the stage where permanent governance decisions are made based on evaluation and action-taking (RODRIGUES; CARPES; RAFFAGNATO, 2020). Preventing outbreaks involves different courses of action in terms of planning for resources, balancing investments in types of care, conducting epidemiological research and assessing preparedness (JAIN; DUSE; BAUSCH, 2018).

The complexity makes it clear that it's not possible to discard the previously discussed impasses in this arena. In fact, prevention became one of the "magic concepts" of public policy, due to its attractiveness, broadness and marketability, when in reality there's a large gap between theory and practice of its implementation (BOSWELL, 2022).

"Health policy is the traditional home of prevention policies [. . .], but in practice there are continuous tensions between preventive and reactive policies." (CAIRNEY; DENNY, 2020, pg. 137). Amidst the many reasons for that, we can highlight: 1- it's hard to provide scientific evidence links to policy solutions in the case of health inequalities; 2- the operationalisation of health recommendations can be uncertain; 3- prevention's impact and success are difficult to measure; 4- and finally, reactive policies, for all policies but especially in the health arena, are generally more urgent (CAIRNEY; DENNY, 2020).

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[1] Epidemics are the most common example of a health disaster.

Why should this be a concern for political scientists, considering the technical aspect of its nature?

It's a general consensus that policies should be based on evidence. Health policies favour the use of strictly clinical and biomedical evidence, as demonstrated by official guidance and recommended checklists to health interventions (Organisation mondiale de la santé, 2018). However, medical research is not necessarily - or exclusively - the type of evidence that influences decision-making. Policymakers take into consideration knowledge that comes from consultation with groups or networks; ideas and interests shaped by personal and professional beliefs; economic implications as to the use of resources and opportunity costs; and last but not least, pure politics such as salience to the government agenda, political risk, opportunities and crises (BOWEN; ZWI, 2005).

Studies of public health planning try to depoliticise data, framing it as purely technocratic, which not only ignores political economy concerns that have an important role in *how* evidence is utilised, but also are not reflective of real policymaking, especially in low and middle income countries (LMIC) (PARKHURST et al., 2021).

To illustrate this, let's take infectious epidemics and pandemics planning. This is particularly relevant to LMIC, which still struggle with infectious diseases as the main public health concern, unlike rich and industrialised countries (RIC), that have gone through the epidemiological transition and can focus on prevention of lifestyle and individualistic diseases like cancer, cardiovascular problems or tobacco use consequences (SUNDIN; WILLNER, 2007).

Literature on the challenges in preventing epidemics is mostly about technical recommendations, such as assessing outbreak response and preparedness, establishing workforce and infrastructure capacity, stimulating outbreak-related research and development, and collecting outbreak analytics such as transmissibility and mortality (JAIN; DUSE; BAUSCH, 2018; POLONSKY et al., 2019).

It's even recognised by the same literature that of all types of epidemiological data, intervention data is rarely collected (POLONSKY et al., 2019; SHEARER et al., 2020). But health risks are complex problems highly influenced by politics, economics and other social determinants. Epidemics are as much social problems as they are medical ones. And yet, natural sciences still represent the knowledge predilection when assessing public health and health policy outcomes, focusing on technological innovations and leaving aside solutions to

the intrinsic power structures of political contexts (SUNDIN; WILLNER, 2007; SHEIKH et al., 2011; Organisation mondiale de la santé, 2018).

Political aspects are crucial in informing decision-making about those health interventions. Features of a political system, especially the interaction of ideas and institutions, can influence the behaviour of political agents and the policymaking (BéLAND, 2010; LAVIS et al., 2012), and by consequence, its outcomes.

What I'm doing is putting a spotlight on the political aspects that are relevant for understanding health decision-making (specifically the emphasis in prevention), and considering them as independent variables.

Political economy framework works with "the three Is" as independent variables: interests, ideas and institutions, which work as conceptual categories for thematic analysis (PARKHURST et al., 2021). Those three categories are explored in the literature as potential explanations for healthcare policy choices, constituting a country's health politics (IMMERGUT, 1992; STEINMO; WATTS, 1995; TOTH, 2020).

Health politics, or how actors and their interests interact in the political arena, added to public opinion and driving political forces, will result in a model of healthcare system that reflects those factors behind the final choices, just like political systems (IMMERGUT, 1992; STEINMO; WATTS, 1995; TOTH, 2020). While empirical evidence on the impact of cultural ideas and opposing interests fails to account for health policy reforms, the procedural approach of associating institutions and the resulting distribution of power to healthcare choices has been fruitful (IMMERGUT, 1992; STEINMO; WATTS, 1995).

A health system can be defined by a functional and an informal parts: the functional works to bring policy outcomes, like finance, medical products, information systems, human resources, organisation structure and legislation, and forms of service delivery; the informal part is composed of interests, norms and values. A health system includes not only the suppliers, but also the recipients of health outcomes (SHEIKH et al., 2011) being intrinsically connected to the policymaking process.

Important features of health systems are shaped by institutional arrangements and can influence decision-making towards specific health policies. Governance arrangements, like policy authority or organisational authority; financial arrangements, like what types and sources of funds are used to finance and how providers are remunerated; and delivery arrangements, such as where, with what and by whom care is provided, are some examples (LAVIS et al., 2012).

The beginning of this chapter's discussion should not be trivialised. Preventive policy-making faces pragmatic limits, like shortsightedness promoted by electoral cycles, inflexible bureaucratic routines and interests for immediate profit (BOSWELL, 2022). Considering that preventive policies, even if in a limited scale, still are implemented, I wonder if there is any difference in policymaking arrangements that makes a country put more emphasis on prevention.

Literature describes policymaking in various ways, so I decided to adopt a simple umbrella definition. Policymaking is the "process by which policies are discussed, decided, implemented, evaluated, and modified. [...] Policymaking is a continuous process." (TOMMASI; SCARTASCINI, 2012, pg. 265)

From all arrangement concepts possibly derived from this definition, I'm focusing on direct decision-making process elements, which embody institutional setting and policy structure (JACOBS, 2016). The policy structure for preventive health policy will be understood as the health system *per se*, as it grabs the complete functionality of a health policy.

To study emphasis on prevention, there are two possible concept approaches: policy formulation and implementation. For implementation, the systemic broad framework is able to apprehend observable trends and associations. For formulation however, the processes are way more invisible and would require a narrower overview.

I'll adopt both approaches, tweaking the research design accordingly to capture these different stages.

2.3 Framework of analysis: the systemic-level relationship between policymaking arrangements and policy choices

Decision-making occurs in arenas of direct interaction between actors. That means restricting policymaking arrangements to institutions on the meso and micro-levels.

At the meso-level, the key components to understand policymaking are which actors are involved, at what level of government they operate, and under which rules or procedures. At the micro-level, we need to know how knowledge shapes the way policymakers try to address prevention, and which events have prompted or undermined policy choice or development (CAIRNEY; DENNY, 2020).

It should be noted that my analysis is not going to the agent level. This means I won't track personal preferences or interests, just the system of incentives they are inserted in. This choice is deliberate, considering that political motivations for enacting programs or policies

vary enormously (IMMERGUT, 1992), and they are very hard to measure, especially at an aggregate degree.

It is important, however, that I consider the demands of agents if my theory involves them (ESPING-ANDERSEN, 1991). Conflicts must be substantive in content. Preferences can be an analytical assumption even if we don't have empirical knowledge about them.

The effects of the interaction between ideas and institutions can and should be done, as it's still an under-explored research agenda in the literature, but it would need a different framework of analysis. (BéLAND, 2010).

To argue which policymaking arrangements could be more associated with emphasis on prevention, we need to understand the mechanisms behind this relation, or *why* and *how* policymaking affects health policies.

2.3.1 Why?

Thomas Schelling's classic argument that different micromotives are translated into macrobehaviour (SCHELLING, 2006) still applies in policymaking settings.

Implementing a systemic view means motives and behaviour are both studied at an aggregate level. While characteristics inherent to the actors involved in the process of policy choice may matter, the environment they are in can have a great impact, especially in a multi-centric policymaking environment. Formal and informal rules, or standard operating procedures within a policymaking organisation, can shape policy decisions, not directly, but through their impact on the process by which policies are designed, approved and implemented (SPILLER; STEIN; TOMMASI, 2003; STEIN et al., 2005; SCARTASCINI et al., 2010; BOSWELL; CAIRNEY; DENNY, 2019; CAIRNEY; DENNY, 2020). There's a growing awareness in literature that public health successes are often dependent on political decision-making (MACKENBACH; MCKEE, 2015).

Policymaking arrangements → Decision-making process → Policy characteristics → Policy outcomes
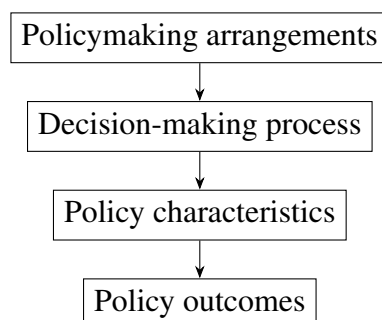
Source: Author's elaboration based on (STEIN et al., 2005)

Literature suggests that the interplay between institutional conditions has explanatory power on service delivery, and hence different configurations of rules will result in different policy outcomes (BAZZAN et al., 2022). My framework doesn't go as far as the policy outcomes, staying around the middle of the scheme, as I argue that policymaking arrangements will induce certain policy choices.

To make it very clear, I do not claim effectiveness or normative impressions on the public policies as a result of policymaking processes, just that the choices are different.

This strategy means I keep the level of analysis on meso arrangements being associated to meso outcomes, and micro arrangements being associated to micro outcomes. This is important if I my argument depends on a linear logic of action, making it distinct from studies that use meso arrangements having effect on micro outcomes (like policy results) (STEIN et al., 2005), or macro/meso arrangements having effect on macro results (like economic performance) (LIJPHART, 2012). In both of these scenarios, the distance between explanatory factors and variable of interest make the causality feeble.

These processes don't happen in a vacuum. There's an endogenous relationship between actors and institutions where both factors feedback each other. Actors are not submitted to procedures: they choose them because they reflect their interests, and make the continuous choice to abide to them (MARTIN; VANBERG, 2011). What actors don't choose are the consequences in behaviour due to the stimulus of institutions. So the resulting processes are not necessarily a conscious choice, even if embedded with preferences.

When the environment of institutional stimulus becomes predictable, it's easier for the actor to navigate decision-making, as they are more aware of what may come from their choices. It's when uncertainty hits - the lack of information about the future, that the environment becomes less ideal for policymaking, especially for intertemporal agreements.

Uncertainty might come from the decision-making arena, or from the policies themselves. "Who is going to be in government tomorrow? Will they cooperate with me if I choose a certain policy? What if I don't get reelected, will someone get the credit away from me? Will this policy have results I can claim? Will the bureaucracy agree in implementing this the way I want to? Will legislature?" These are some questions a policymaker will have in mind, and if there's a window of opportunity, they could try to design an institutional setting that controls those concerns to a certain degree.

When minimising uncertainty, the created environment stimulates cooperative policy-making as there are constraints to change, which are more conducive to intertemporal agreements, and long-term commitments are more credible (SPILLER; STEIN; TOMMASI, 2003; STEIN et al., 2005; SCARTASCINI et al., 2010; JACOBS, 2016). Sometimes policy environments may have conditions for long-term prevention policy, but elected policymakers can intervene to change policy trajectory, producing instability. That's why ideally the analysis shouldn't only focus on macro-institutions like presidentialism vs. parlamentarism (CAIRNEY; DENNY, 2020), but the systemic decision-making rules.

Institutions have a low rate of change, and it's a hard process to instigate, as a way to control uncertainty from the future. The collective action necessary to coordinate a movement in a different direction is so costly that it creates increasing returns to keep the status quo (PIERSON, 2000). Increasing returns, or path dependence, is even more powerful when it refers to arrangements instead of single institutions - what Douglass North calls an institutional matrix (NORTH, 1990; PIERSON, 2000).

Continuity and change in policies can be explained by institutional arrangements, and the path dependence created by them (PIERSON, 2000; VITALE; MEIJERINK, 2021), because institutions forge historical persistence of policy paradigms (CASTELLANI,).

Examples of paradigms can refer to governance and policy practices that are passed down over time. Policymakers will act on these traditions when it comes to react to events that require a policy response, like a pandemic for example (TREIN, 2020).

The effect of institutional settings on the continuity of social policies occurs through policy feedback. Policy feedback is the process of a created policy shaping the subsequent policymaking, political agenda and governing operations, having lasting consequences for policy outcomes through self-enforcing political equilibria (MARES; CARNES, 2009; METTLER; SORELLE, 2018). Through a systemic analysis, instead of observing individual actors, it's possible to identify negative and positive feedback, extended regularities, path dependence and emergence behaviour (CAIRNEY; DENNY, 2020).

Positive policy feedback makes it harder to revert political decisions as it establishes a path of action and persistence of attitudes even after the original institutional channels disappear (ACHARYA; BLACKWELL; SEN, 2016; BRADY et al., 2016). It reinforces the previous policymaking trajectory.

Negative policy feedback, when it *undermines* policymaking trajectory, is also important but tends to be neglected from the literature (BRADY et al., 2016). For social policies it's particularly relevant, as per some examples: The patronage system for delivery of Civil War pensions in the US created a disbelief by reformers in social spending programs (METTLER; SORELLE, 2018); Once budgetary issues hit even rich democracies, social policies become polarising, especially healthcare, which constantly inflates when the population gets older (BRADY et al., 2016); Economic vulnerabilities created by the process of industrialisation that imploded in the 1980's in developing nations set social policy path dependence in those countries (MARES; CARNES, 2009).

A controversial example of negative policy feedback is the NHS Health Check programme, a preventive policy implemented by the UK for early detection of cardiovascular disease in the population. Even officials overseeing implementation of the programme are sceptical over its efficiency, and yet it keeps being not only renewed but expanded across different governments. This happens because the policy makes a vague prevention goal as a tangible thing, attracting resources for the long-term. Failure of the policy doesn't matter, because prevention acts as a partial progress in the face of uncertainty, complexity and contestation (BOSWELL, 2022).

Prevention policymaking is part of both ends in this process. It's a type of policy that requires continuity, operational implication being regular re-authorisations or upkeep reforms from time to time. Especially in the case of health policy, target populations of such policies can affect the alternatives policymakers consider legitimate in the future (METTLER; SORELLE, 2018). The policy structure also largely benefits from less uncertainty and builds positive policy feedback. Literature finds that a structure less vulnerable to change, like non-fungible assets and trust funds separated from the general government budget, is more credible to citizens (JACOBS, 2016).

Historical analyses have shown that development and economic policies benefit from being carried out in stable institutional infrastructure. Institutional discontinuity causes its insufficiency, as innovations are easily dismantled. Mechanisms of public participation are delayed in this scenario. If there isn't a structure for conducting formulation and orchestration of policies, this will go to the Presidency, even without the necessary organisation for this task. The lack of institutional infrastructure for development policies means there's no entity respon-

sible for capacitation and coordination, nor adequate research that would help the State to plan its policies (SIKKINK; WOLFSON, 1993).

The necessary continuity for prevention makes it necessary that we look at its historical path to understand its current emphasis.

2.3.2 How?

There are some examples in the literature on which institutional settings are more conducive to intertemporal agreements: fragmented authority diffuses accountability for losses and impedes policy reversal; term limits neutralise short-term electoral considerations; incumbent-favouring electoral institutions insulate against short-run electoral risk and enhance opportunities for long-term credit claiming; institutionalised power sharing enables prospective beneficiaries to enforce long-term bargains and creates reputational costs to reneging (JACOBS, 2016)

However, the types of institutional settings of interest for this study are the ones regarding direct decision-making processes arenas, where the main policymaking actors are situated. This is important theoretically and methodologically, as it shortens a causal connection line.

My main argument is that more emphasis on prevention will be found in settings where the arrangements minimise uncertainty. This will happen when arrangements follow two characteristics: **stability** and **resilience**.

I've been hammering the point about continuity. If there's constant political change, it's not possible to implement long-term policies. It could happen that a policy environment (policymaking) has conditions for long-term prevention policy, but elected policymakers (political system) can intervene to change policy trajectory, producing instability (CAIRNEY; DENNY, 2020). Empirical evidence has shown that institutionalising processes works better than having an organisational body (such as an agency) dedicated to prevention (BOSWELL; CAIRNEY; DENNY, 2019).

A stable policy environment is comprised of a stable arrangement of policymaking institutions, such as the party system, the Legislature branch, and the Executive cabinet: my example of institutional matrix.

Policymaking stability facilitates cooperation - since the group of agents involved in the process is predictable and the distribution of power is known, and boosts information produc-

tion, as it gives time for research and specialisation so the agents can build expertise. This combination stimulates investments in the future: the nature of prevention policies.

On the other hand we also have the policy structure, a component related to the setting where a specific policy operates (JACOBS, 2016), which needs to be capable of maintaining a policy, despite external shocks. A policy structure needs to be resilient to deal with uncertainty.

Resilience is not an outcome, but a quality of a system that is able to bounce back to a functioning state after unexpected dangers hit and damage. Resilience and anticipation are alternative strategies for decision-making in the context of risk and uncertainty (ROSS, 2013). A resilient health system manages uncertainties and increases its ability to implement preventive measures (JAIN; DUSE; BAUSCH, 2018; EWERT et al., 2023).

Resilience is a part of factors relevant to policy structure, such as decentralisation and health system.

As I explain in more details further in this section, fragmentation of decision-making and power structures inhibit emphasis in prevention. This goes against the literature based on Lijphart (LIJPHART, 2012). In this competing explanation, an institutional arrangement that creates the so called "consensual democracy" is more fragmented, and therefore more stable and brings better economic performance.

Our arguments are clearly the opposite from each other. I justify my position in two fronts:

First, I repeat that my level of analysis is meso arrangements being associated to meso outcomes, while Lijphart uses macro/meso arrangements being associated to macro outcomes. This approach is too broad to represent the kind of relationship I'm looking for, and it ignores the fact that policymaking is still made in non-democratic scenarios, where institutions could be equally stable;

Second, Lijphart's argument is about results, while I focus on processes. I'm not elaborating an unique ideal view of a group of decision-making features, I'm not arguing for better results. My main point is that the nature of the policy requires a specific type of arrangement. Different types of policies will come from different policymaking processes, and that's why there's no perfect general institutional setting.

In fact, interests are not exogenous to the State. The policymaking arrangement is nothing more than the representation of the clash of ideas and interests, a political construction of the historical moment it was created.

This is also the case for a policy structure, which is the concoction of preferences for social rights of the winning political coalition (IMMERGUT, 1992). I'm merely associating processes to choices.

I'm going to break down my two mechanisms into variables in the next sections.

Policymaking Stability

(i) Institutionalisation of party systems

Political parties are direct, if not the main actors of policymaking. Empirical studies have found that characteristics of party systems such as institutionalisation, nationalisation, polarisation, and programmatic vs. clientelistic politics, have been shown to affect policymaking processes in Latin America. Institutionalisation in particular makes parties more programmatic and have a more prominent role in recruiting, the consequence being consistency of policies over time, and hence stability (JONES, 2010). This element will be my focus when including party systems.

In the original definition of party system institutionalisation, four dimensions composed the concept: stability of competition, strong party roots in society, legitimacy of the parties and the electoral process, and solid organisations (MAINWARING; TORCAL, 2006).

We should notice that changes in party systems are not the same as changes in parties, as the specific aspects of the later are expected to always change. A change in the party system refers to changes in alignment with voters or decline of relevant cleavages (MAIR, 1989). Contrary to intuitive logic, changes in cleavages usually go towards stability with time by pacification or homogenisation of political conflicts. This process makes the salience of old cleavages decrease (BARTOLINI; MAIR, 2007).

This is one of the problems of the original definition: some of the dimensions concern aspects of individual parties (for example, the programmatic vs clientelist party profile), instead of reflecting a systematic scenario. Another issue is that those dimensions mix causes and effects, which potentially raises measurement errors (LUNA, 2014). The one systematic dimension, electoral competition, which is normally measured by electoral volatility, passed through a wave of criticism, where it was questioned if the indicator is really measuring stability (LUNA, 2014; WILKINSON, 2015; BéRTOA, 2018)

The concept is resumed later by the same author, where the critics are addressed (MAIN-WARING, 2018). All the dimensions were dropped but for the stability of competition. In response to the critique that path dependence of party systems works for advanced industrial democracies but not the constantly stressed institutions of Latin America, empirical tests show that even in weakly institutionalised systems there is influence of past electoral volatility in the current ones.

Even if not always desirable (when there's a latent need for policy change or innovation), institutionalised party systems provide more stability to policy, create barriers for political outsiders, and produce more experienced politicians (MAINWARING, 2018).

On average, Mexico, Uruguay and Chile are the most stable systems in Latin America since the 1990s. Other countries have faced erosion of systems (Argentina, Colombia, Venezuela), or actual increase in institutionalisation (Brazil, El Salvador and Panama). (MAINWARING, 2018).

(ii) Legislature capabilities

In Latin America, legislature-executive negotiations tend to happen behind-the-scenes, making it harder to measure its policymaking role. So, we can evaluate the potential of decision-making producing cooperation and stability through the legislature's capacity of implementing policy. The institutional operational factors that drive a legislature's role in policymaking are: formal powers, amount of political space afforded by other power holders and capacity afforded by its procedures/structures/support (SAIEGH, 2010).

There are two schools of thought that model legislative parties behaviour according to their theoretical interests: the informational efficiency theory and the majority party cartel theory.

The informational model puts policy uncertainty at the centre of legislators concerns: the reduction of uncertainty benefits everyone, regardless of their personal goals, and this is done by generating policy expertise. A Congress committees system is an instrumental structure created to enhance and cultivate information production necessary for that expertise. Committees have power by monopolising information. (KREHBIEL, 1992).

The party cartel model assumes a cyclical causal chain of action when legislative parties pursue their biggest interest: agenda power. The idea is that a majority party will

control agenda powers, which brings legislative success, and in its turn it creates a good reputation for the party, making them once again majoritarian after reelection. The final achievement of the cycle is getting back key internal positions in the congress, like salient committees. These parties play their agenda power not in coordinating voting in the House, but by deciding which bills will be up to discussion (COX; MCCUBBINS, 2005). Legislators operate under an incomplete contract, so the cartel institutions have a role in promoting cooperation between the actors, a key aspect for political stability (WEINGAST; MARSHALL, 1988; COX; MCCUBBINS, 2005).

While working with different institutional apparatus, both models share similarities. First, they abdicate from the monopoly of power when they need to avert the risk of ineffective policies, by delegating agenda power to agencies or other actors, and by sharing policy information with the House (EPSTEIN; O'HALLORAN, 1999). Second, both models use the committee system as a way to gatekeep bills the parties don't want submitted to voting (GROSECLOSE; KING, 2001).

More recent literature is focusing in legislative committee systems as powerful parliamentary institutions. It allows parties to gather information and hence formulate policy alternatives, which makes coalition conflict solving more effective, besides permitting shadowing partners in the policymaking process (MARTIN; VANBERG, 2011).

Other aspects of institutional design, like statutory authority between legislative and executive, or political processes, like the formation of supermajorities, are important to designate the power the legislative has (CHAISTY; POWER, 2023), but the existence of committees are the most important because they grant efficacy to the other legislative institutions (MARTIN; VANBERG, 2011).

So, regardless of which mechanisms they activate, the takeaway from both classic models is the centrality of a committee system in representing legislative capabilities of policymaking, and in boosting cooperation and stability between actors, the necessary grounds for promoting preventive policies.

And while not an institutional setting, I would like to bring back the public opinion aspect I discussed previously. Population is sceptical of long-term policies due to lack of trust in politicians to actually implement them, which is mentioned as one of the reasons this type of policies is hard to implement (JACOBS, 2016). When the opposite happens, meaning

when the population has confidence in the Congress, it increases the likelihood of the legislatures making investments to build capacity (SAIEGH, 2010).

To illustrate Toral's 2021 argument that health tends to be a highly salient theme, I bring data from a public opinion poll in Latin America in Figure 1.

Figure 1 – Perception of fairness of access to health services in Latin America (2020)
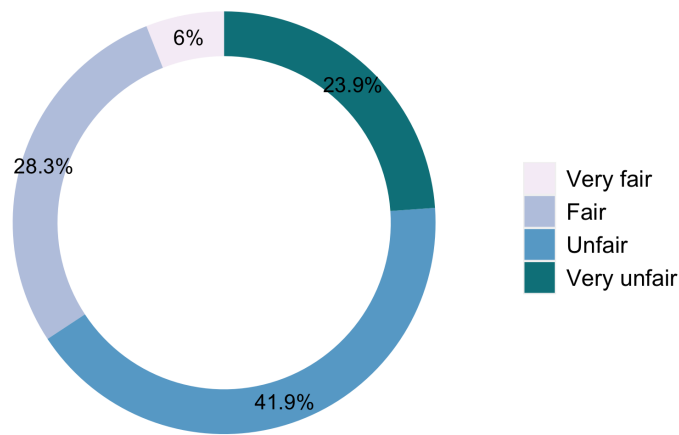
Source: Author's elaboration from (LATINOBARóMETRO,) data

Three in every four people consider the access to health services unfair or very unfair. This perception indicates these issues are at least in the citizen's mind, enough to bring discomfort instead of apathy or plain satisfaction.

It's relevant, then, to add confidence in the Congress as a factor of legislative capabilities, as it could be an indicator of how comfortable legislators are in pushing for this type of policies.

(iii) Cabinet politics

The Cabinet is the epicentre of all policymaking processes, from policy formulation to implementation. It has a crucial role as it controls policy design and contains the implement-

ing bureaucracy. Intertemporal agreements can be enforced when the cabinet features enforce coordination and cooperation between its actors (MARTíNEZ-GALLARDO, 2010).

What's challenging about cooperation in cabinets is the characteristic mixing of political and bureaucratic actors' interests where there's no formal preferences aggregation method. In the legislative arena, negotiation and conflict are defining parts of the policy-making process - legislative institutions are designed to handle competing interests with clear winners and losers at the end of the ordeal.

This is not the case for the Cabinet. The outputs from the Executive branch are unique, and for better or for worse will be attributed to the head of the government, whether they were a byproduct of consensus or simply patronage.

In multiparty systems, where the head of government's party is usually in minority at the parliament, coalition partners will also be part of the Cabinet environment. Some are looking for change in the governments' policies so they are closer to their own preferences, and the easiest access to that comes from taking over a ministry - these are policy-seeking actors. If they're office-seeking parties, the policy is not as important as just getting any ministry (LAVER; SHEPSLE, 1990).

This isn't unilateral bargaining, though. Portfolio is distributed as currency by the president or prime-minister, and parliamentary force of a party is not the only criteria in the calculations of pay-off from both sides (LUPIA; STRøM, 2006)

While coalition formation solves the issue of minority governments, it opens up another situation, which is the governance of the coalition in the cabinet. Coordination has costs, and the coalition leader may lose control over the policy (LAVER; SHEPSLE, 1990). The bigger or more fragmented the coalition gets, the bigger is the uncertainty and the possibility of forming alternative coalitions (NETO; SAMUELS, 2010).

Literature from the 1970s proposed that minority governments are more prone to instability due to legislative fragmentation and high polarisation. Empirical evidence, however, has shown that these hypotheses are not sustained in reality. In fact, if they consider the costs of policy compromise and anticipated electoral losses are bigger than the benefits of governing, parties will prefer to influence policymaking from the opposition (STROM, 1984).

The rise of coalition presidentialism, where minority presidents in multiparty systems form coalitions to govern like in parliamentarism, has developed extensive literature on how these presidents coordinate multiparty cabinets.

Maintenance and management of a coalition requires the ability to use a number of institutional tools at the president's disposition, such as: legislative and partisan powers, cabinet and budgetary authority, and exchange of favours. Each type of strategic interaction will come with a cost, which should be evaluated as part of the decision-making (CHAISTY; CHEESEMAN; POWER, 2018).

Executive fragmentation usually means a larger budget, as different agents represent different interests at all stages of the budget process. To appease all the coalition partners means spending more money (TOMMASI; SCARTASCINI, 2012; ESLAVA, 2012). One can say that, pessimistically, it's improbable for future-oriented goals to exist in coalition presidentialisms.

A complex environment has two types of cost: the ones that come with strategic decisions, and the one inherent to the bargaining process. It's easier to hold intertemporal agreements when the cabinet is less costly to manage.

Frequent minister change, for example, means the agents can't develop specialised background. Stability of the actors that conduct the every day business of governing and shaping policy is crucial at this scenario (TOMMASI; SCARTASCINI, 2012).

A simpler environment follows three main features: **cabinet formation**, as it determines number of government parties and their relationship, a proxy to how easy it is for policy to be changed; **structure of the cabinet**, which is relevant for coordination and flexibility in the policymaking; and **cabinet stability**, necessary for intertemporal agreements and better policy (MARTíNEZ-GALLARDO, 2010).

Resilience

(i) Decentralisation

Moving away from the search for stable central decision-making, the other side of the coin is the policy structure, whose resilience favours long-term policies. A crucial condition

shown by public policy literature is that policies and policymaking differ if we are dealing with multi-centric policymaking environment.

While decentralisation is not an arrangement directly associated with decision-making, it shapes decision-making arenas and distributes number and power of policymaking agents. Direct decision-making institutions are attributed to national governments, but there are differences between countries on how relevant subnational governments are to policies. Policies associated with a welfare state, like healthcare, are highly dependent on the number of actors with policy authority and their level of autonomy (GREER, 2010).

"Legal and fiscal structures shape the space within regional governments can diverge, and thereby the extent to which they can influence a country's health policy outcomes." (COSTA-FONT; GREER, 2013, p. 32).

The key components of political decentralisation are allocation of resources and allocation of responsibility, an efficient way to embrace heterogeneity of a population (COSTA-FONT; GREER, 2013; GREER; FONSECA, 2015). Usually health powers and health policymaking are not the general political issues that drive the creation of regional governments, meaning that the quality of health policies are not the main concern of decentralisation (COSTA-FONT; GREER, 2013), even if the governance of healthcare is highly affected.

Literature on the effects of decentralisation on healthcare is diffuse and it shows both positive and negative evidence. Systematic reviews conclude that decentralisation can have any or no effect, and in the end it depends on how the institutional design promotes fiscal balance, competition, innovation and accountability (COSTA-FONT; GREER, 2013). This is only identifiable when we think less about the country level of decentralisation and more about how laws, money and policies actually work in a more precise level of analysis (GREER; FONSECA, 2015). There's no empirical evidence of a relationship between decentralisation and quality of government (TREISMAN, 2002).

A case study of Tanzania is an emblematic example. Envisioning improvement in the control of tropical diseases, a national initiative decentralised the decision-making process in healthcare. The idea was that districts would be able to better identify demands and elaborate a budget for national funding through horizontal integration with local governments, local health councils and agencies, and the community. Studies have found

that this move wasn't successful, and there was no difference between districts in different stages of decentralisation (MUBYAZI et al., 2004; MALUKA et al., 2011).

Qualitative policy analysis spots that local actors do consider decentralisation desirable, but national planning guidelines and budget ceilings are overwhelming and hard to follow while keeping local needs in sight (MALUKA et al., 2011).

Resilience is built from local administrative and political elites, as the solutions and infrastructure for mitigating risks are at the local level. A resilient response to a disaster has engagement of the community as a crucial attribute (ROSS, 2013). However, when talking about a country as a whole, the limitations start to appear.

On one side, decision-making diversity generated by decentralisation is a normative asset defended by public policy literature. On the other, social policies call for decision-making centrality, considering that social issues affect a whole nation (OBINGER; LEIBFRIED; CASTLES, 2005).

More actors in the coordination game means more veto points for the development of a welfare state (GREER; FONSECA, 2015). Fiscal arrangements and the central government responsibility level vary largely between countries, where some sub-national unities don't receive any kind of automatic transfer, while others may compete or cooperate for federal funds (OBINGER; LEIBFRIED; CASTLES, 2005; GREER; FONSECA, 2015).

For healthcare, fiscal federalism literature says that health systems should be financed with the largest possible risk pool while having local delivery and accountability. However, it should be noticed that it's almost impossible to find generalised statements on the relationship with cost, containment, quality and access to health policy (GREER; FONSECA, 2015). Decentralised systems are better in embracing heterogeneity, but centralised systems are better in the the case of global public goods with spillovers in the population, such as managing epidemics and communicable diseases (COSTA-FONT; GREER, 2013)

I bring back the nature of the policy to the discussion. The lack of consensus in this literature suggests that the association between processes and policies shouldn't be generalised without taking into consideration the nature of the policy. For intertemporal agreements that produce preventive policies, centralisation seems to be more conducive.

(ii) Health systems

Studying the health system is the best way to capture the policy structure of healthcare.

No public policy area is so internationalised as health. While paradigms for other salient themes like education and security differ from one place to the other, health is submitted to strict protocols and categorisations in a worldwide basis. This means that, as a policy structure, health systems are highly comparable between countries.

Notwithstanding, they are not devoid of a political component. In fact, a health system is the reflection of the power distribution and level of influence of interest groups in its originating sequence of events (IMMERGUT, 1992; STEINMO; WATTS, 1995; TOTH, 2020). Health systems are not only the means for implementation of health policy coming from top-down, they are also involved in the decision-making process (LAVIS et al., 2012).

The concept of health system resilience surged after the Ebola epidemic of 2014. A resilient health system manages well knowledge, uncertainties, interdependence and legitimacy. We shouldn't give in to the approach of removing the context out of a health system response, as if there's a default apolitical way of conducting crises (EWERT et al., 2023). Resilient governance depends on the design of national health system institutions, as it's a product of the institutional heritages, path dependencies and the social-political circumstances of different historical periods (IMMERGUT, 1992; EWERT et al., 2023).

In a way, we can say that the pandemic of COVID-19 worked as a random empirical test to the components, to improve the theory of better arrangements to deal with uncertainty. It showed the main weakness of each health system around the world, and we watched as adaptive changes were made to accommodate those weaknesses.

To understand the policy process used to explain a certain policy change, it's necessary to consider the change as political. Terms of health system studies such as "recovery and learning" don't capture the political nuance involved in the process. Health systems' bottlenecks (soft spots or systemic weaknesses) happen when institutional structures don't prevent or properly respond to a crisis. Being able to deal with bottlenecks makes a health system resilient. Bottlenecks are not universal, but conditioned to the country and health system context they're in (EWERT et al., 2023).

COVID-19 represented a great stress in all health systems, but response to it wasn't particularly effective in decentralised health systems. Fragmentation of healthcare competences and delivery was a common feature in countries where decision-making was slow and uncoordinated, resulting in high fatality rates (BALI; HE; RAMESH, 2022; EASTON et al., 2022).

Even at a global scale, the uncertainty over the existence of WHO in the long-term future encouraged local initiatives to create outbreak prevention agencies, a level of fragmentation that is already being discussed as not positive to global public health (JAIN; DUSE; BAUSCH, 2018). Health system decentralisation has also been largely promoted as a solution to the misalignment between budgeting and planning in the health sector of developing countries, despite the potential increase in inequities in service provision, and the lack of conclusive empirical findings on the matter (TSOFA et al., 2017).

A specific set of health system arrangements is a result of historical choices, and institutional arrangements influenced the crisis response by national and sub-national leaders. Centralised and national level seem to have better powers to coordinate a health crisis (BALI; HE; RAMESH, 2022; EASTON et al., 2022). Based on this evidence, we could argue that resilience of health systems blossoms in national system models [2].

The fragmentation of services not necessarily happens as an organisational setting. Financing is an important aspect of it.

For example, in Brazil, 60.4% of the expenditures come from the private sector, generating fragmentation of services and inequalities in their access (SCHEFFER et al., 2022). Private insurances also tend to focus exclusively on curative care, making them ill-prepared for tackling health crises, and even worse for resilience if health public financing keeps increasing as private (BALI; HE; RAMESH, 2022).

Financing public health models are classified according to the level of government intervention in the medical services. Depending on the extent of government financing, regulation, ownership of facilities and employment of doctors change accordingly; each of these dimensions has a political origin (IMMERGUT, 1992).

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[2] More on health system models on chapter 3

Private insurances prefer individualistic curative (more expensive) care, and they create fragmentation and inequality of services provision, whereas preventive care is consumed by the collective.

In fact, public expenditures tend to be more preventive. In Latin America countries, individual curative actions are hired by insurances of private or public providers, and public collective health ends up being a responsibility of the public and sub-national governments (GIOVANELLA; ALMEIDA, 2017).

Other Existing Explanations

Empirical literature findings have shown evidence of important political covariables that are not directly associated with the decision-making process but seem to affect health outcomes. These may be added as control variables, at the discretion of model parsimony.

(i) Regime type: regarding associating levels of democracy, it's a very common explored theoretical relation. It appears to strongly influence health outcomes in countries of Central and Eastern Europe (MACKENBACH; MCKEE, 2015) and in the Arab World (BATNIJI et al., 2014). However, for developing nations, a simple taxonomy of democracy doesn't explain that variation, especially considering that many social security programs were implemented during non-democratic periods (MARES; CARNES, 2009).

(ii) Size of government: left-right ideology is usually associated with more and less social spending, respectively. Significant negative association between right-wing cabinets and health spending (BRADY et al., 2016) and positive correlation between political parties with egalitarian ideologies and commitment to universal healthcare coverage (NAVARRO et al., 2006) are found for rich OECD democracies. These studies fall in the same issue of the lack of temporal nuance and empirical observation for developing countries (MARES; CARNES, 2009). Also, regarding ideology, a meta-analysis shows that this aspect of politics doesn't matter for outputs of public policies (IMBEAU; PETRY; LAMARI, 2001).

(iii) Quality of government: In rich OECD democracies the evidence is still inconsistent and warrants more study (MACKENBACH; MCKEE, 2015), while a clear adverse effect of poor quality of government on the relation between health expenditures and health

outcomes is found on Middle East and North African (MENA) countries (BOUSMAH; VENTELOU; ABU-ZAINEH, 2016).

(iv) Health expenditures: being the first or second most expensive social policy in all rich democracies, it's natural that health expenditures are a great variable of interest. For rich OECD democracies, path dependence on initial levels of health expenditures are significantly and positively associated with current levels (BRADY et al., 2016). The relationship between health expenditures and health outcomes in the MENA countries is conditioned by the quality of institutions, as inefficiency, corruption and cronyism in health sector have negative effects on access to and quality of health care services (BOUS-MAH; VENTELOU; ABU-ZAINEH, 2016). WHO has recommendations on how much of a country's GDP should be directed to health expenditures.

2.4 Argument and hypotheses

Which policymaking arrangements are more conducive to preventive policy?

My main argument is that policymaking arrangements can improve the quality of information on future conditions and stabilise political commitments, working then to **minimise the uncertainty** that is a major obstacle to the formulation and implementation of prevention policies (JACOBS, 2016).

The best scenario for a higher emphasis in prevention policies is the one that permits cooperation between agents, and where stability of decisions and resilience of policy structure is expected. This combination reduces uncertainty about the future, creating a fertile ground for intertemporal agreements, and by consequence long-term policies.

Given that stability is the key word in the mechanisms presented here, and also the nature of the determinants, I reiterate the importance of policy feedback. Once a policymaking arrangement brings credibility, it reinforces the positive feedback so it's less vulnerable to change. The stability comes from this positive feedback. This further ensures the role of path dependence and its impact on preventive policy, and my research design will take this into consideration.

In the direct decision-making arena, the policymaking arrangements I study are party systems, legislatures, and cabinets. Analysed together, they express the level of Policymaking Stability, a condition that facilitates the emphasis on prevention.

Policymaking Stability expresses the idea of analysing arrangements through a systemic perspective, being comprised by North's 1990 institutional matrix. The big picture of interaction between the main policymaking actors should be captured by this concept. Each individual component of what constitutes a stable policymaking environment has a theoretical expectation regarding its effect on emphasis in prevention, but the general premise is that Policymaking Stability is an incentive to continuity, and therefore, long-term policies like prevention.

H1: Higher levels of Policymaking Stability are associated with more emphasis in prevention policies

Arguing for a path dependence effect denotes this should also be tested. So, I'm expecting that the arrangements from the past go in the same direction of effect when lagged.

Breaking down individual effects of the components of Policymaking Stability:

For party system, I expect that more institutionalised party systems downplay electoral uncertainty by having a stable set of parties in power, and creates consistency in policies as the decisions are not focused on detached individuals, which are favourable circumstances for emphasis in prevention.

Electoral volatility is the mainstream indicator of party system institutionalisation.

H1.1: Institutionalised party systems are associated with more emphasis in prevention policies

A legislature with an important role in the policymaking process without being overpowered by the Executive is usually the one capable of oversight, initiative in legislation, and representation. One of the most important factors that indicates strength of the legislature is the committee system, which has been shown to play a role in building policy expertise, agenda control, and management of executive-legislative coalitions. This being attained, policymaking tends to produce more stable policies, which, as we already established, is a great condition for long-term policies to breed.

Empirical literature is not consensual and at times even subjective in the choice and measurement of indicators of legislature capabilities. The only one I'm borrowing from Saiegh 2010 is *confidence in congress* by the population.

For the institutional capabilities regarding the committee system, many studies use limited sources and artisanal methods of producing classifications. While probably more valid in measurement, this strategy makes it hard for comparable reproducibility. So, I adopt the following V-Dem indicators: *presence of a functioning committee system in the lower chamber*, and

power of introduction of bills in all policies by the lower chamber. Since there's no indicator with more depth about committees, I add the second one as a proxy for the necessity of policy expertise in the legislature.

H1.2: High levels of functionality of a committee system in the lower chamber is associated with more emphasis in prevention policies

H1.3: Having the power of introduction of bills in all policies by the lower chamber is associated with more emphasis in prevention policies

H1.4: Higher confidence in congress expressed by public opinion is associated with more emphasis in prevention policies

The whole theoretical framework assumes that stable and cooperative environments will produce policy agreements with these same characteristics. The main policy design and implementation environment is the cabinet. As mentioned in the previous section, there are three factors that may contribute to the intertemporal agreements necessary for prevention policies, all related to how ensure cooperation and coordination between the policymaking agents in the cabinet, and probability of policy changes:

Cabinet formation (who are the players, indicated by *number of parties in the cabinet*);

Structure of the cabinet (how many players, indicated by *number of ministers*);

Cabinet stability (how long the players stay, indicated by *average tenure time of ministers*).

H1.5: More cabinet fragmentation is associated with less emphasis in prevention policies

H1.6: More policymaking units is associated with less emphasis in prevention policies

H1.7: Longer minister tenures are associated with more emphasis in prevention policies

In the policy structure arena, the main elements are fiscal decentralisation and health systems. The mechanism is resilience of the structure.

Decentralisation has very inconsistent evidence, making it difficult to adjust expectations on how this factor works in my analytical model. Nevertheless, I'm assuming that the welfare state crew is correct about decision fragmentation and fiscal inequalities not helping the implementation of social policies, making the policy structure less resilient. For healthcare issues with collective goals, like prevention, a centralised arrangement is more conducive.

The indicator for fiscal decentralisation is the *ratio between revenue of general and sub-national governments*.

H2: More fiscal decentralisation is associated with less emphasis in prevention policies

Health systems are political products, also contingent to early institutional choices. Fragmentation also poses a problem for health systems, making coordination difficult and leaving it vulnerable to shocks like a health disaster. National and mostly public models are features that make a health system resilient and therefore more capable of doing preventive policymaking.

The indicator for a national health system is the extent of *government financing schemes*.

H3: National health systems are associated with more emphasis in prevention.

What are the driving forces behind a preventive policy choice?

For this question, the analysis is a bit different. The perspective should be narrower if I want to detect events or motivations behind decision-making in favour of preventive policies. Instead of testing hypothesis, I'll keep the argument of stability and resilience, but look for those elements in a policy case study.

This approach also permits the inclusion of elements that won't fit in my comparative quantitative approach due to measurement difficulties, such as the role of ideas and interests, and the use of political evidence.

2.5 Summary

Theory framework is summarised in Table 1 below.

Table 1 – Theory framework

Policymaking arrangements	Concept	Authors	Indicators	Direction of effect
Institutional settings *(mechanism: stability)*	Party system institutionalisation	JONES 2010; LUNA 2014; MAINWARING 2018;	Electoral volatility	Negative
	Legislature capabilities	KREHBIEL 1992; COX & MCCUBBINS 2005; GROSECLOSE & KING 2001; SAIEGH 2010	Confidence in congress Presence of a functioning committee system in the lower chamber Introduces bills on all policy areas	Positive Positive Positive
	Cabinet coordination and cooperation	MARTINEZ-GALLARDO 2010; AMORIM NETO & SAMUELS 2010; CHAISTY, CHEESEMAN & POWER 2018	Number of parties in the cabinet Number of ministers Average tenure of ministers	Negative Negative Positive
Policy structure *(mechanism: resilience)*	Fiscal decentralisation	OBINGER, LEIBFRIED & CASTLES 2005; GREER 2010; COSTA-FONT & GREER 2013	Ratio of revenue for subnational governments	Negative
	Health system nationalisation	IMMERGUT 1992; STEINMO & WATTS 1995; BALI, HE & RAMESH 2022; EWERT et al. 2023	Extent of government financing	Positive

Source: Author's elaboration (2023)

3. IT'S THE SECTOR NEXT DOOR! INTEGRATING CONCEPTS AND MEASURE-MENTS

3.1 Health Systems' structuring role in health policy

Healthcare politics has political actors as the focus of analysis, including the decision-making arenas they are inserted in, and the structure of incentives they respond to. This is a classic study framework in Political Science. Healthcare systems, on the other hand, involve an institutional architecture that is the result of policy decision-making (MARMOR; WENDT, 2012).

Health policies are shaped by the structure used to implement them, therefore, policy choices are conditioned to it.

When comparing, the most basic guideline is to make it clear which set of components make up for differences and similarities, and for that we should look for where the set comes from.

Health systems have a very specific configuration of interests, actors and institutions, and it would be too myopic to zoom in there in trying to estimate the set of components. That's why I'll start from the big picture and follow the steps to my comparison criteria. The logic will follow the order of the steps below:

Social policies → Welfare State → Social Protection Model → Government Intervention Model

Source: Author's elaboration (2023)

The expansion of the notion of citizenship in the twentieth century included some new social rights, like the right to a dignified life, the right of being protected in situations of long-term dependence (such as sickness), and access to health in general. This means health is a right, not charity, and therefore it becomes a State responsibility (FLEURY; OUVERNEY, 2012).

Ideals of welfare state emerge from the effort to guarantee social citizenship and undo class divisions and inequalities produced by capitalism (ESPING-ANDERSEN, 1991; FLEURY;

OUVERNEY, 2012). While the notions may seem universal, each country has its own history of social rights interests, class mobilisations and political groups coalitions. Political fights are not exogenous to the State even in institutional structure, and the State organically assumes an unifying role of the dominating interests (ESPING-ANDERSEN, 1991; IMMERGUT, 1992; FLEURY, 1994).

This process results in countries adopting welfare arrangements that indicate which interests won over. Three dimensions depict how a welfare regime is structured: quality of social rights; social stratification; and the relationship between the State, the market, and the family in social provision. The combination of these dimensions originate the known variations of welfare regime: liberal (found in the US, Canada and Australia); corporatist (Austria, France, Germany and Italy); and social-democrat (Nordic countries). (ESPING-ANDERSEN, 1991).

These variations of welfare regimes characterise the ideology of the resulting social protection models (FLEURY; OUVERNEY, 2012):

Liberal regime is part of the Social Assistance model. The reference for this model is the US, it's a market-driven model. Individualism and freedom are the dominant values, and State help for basic needs is considered a personal failure for the citizen. On the citizens side, donations and philanthropy are highly encouraged. On the market side, private services are subsidised by the government as way to boost participation from the population (FLEURY, 1994; FLEURY; OUVERNEY, 2012).

Corporatist regime is part of the Meritocratic Social Security model. This is known as the Bismarck model, where the State is very present but hardly redistributes. Instead, the benefits received by the citizens are conditioned to the extent of their contribution. Professions are very important in this model as they are the main indicator for not only contribution, but also status between different groups of workers - and the criteria for status is very conservative and tied to religion. Contributions are given according to each own's capacity (financed via proportion of income), and benefits received according to each own's necessity (FLEURY, 1994; FLEURY; OUVERNEY, 2012).

Social-democrat regime is part of the Institutional Redistributive Social Security model. Known as the Beveridge model. It works on the basis of universal social rights, where access to them depends exclusively on necessity, regardless of previous contribution. Financing is entirely via public expenditures (FLEURY, 1994; FLEURY; OUVERNEY, 2012).

Historical processes traced back to how a country's social protection model was originated will spill over the health politics responsible for one's health system. Healthcare legislation patterns are created through the same political, economical and cultural conflicts.

The conflict over the role of the market versus the role of government on national health insurance is significant to the ending look of a health system. Disputes about market and government are based on a real conflict of interest between the buyers and sellers of medical services. The conflict arose when physicians fought against state interference on their economic and clinical autonomy. Liberal model of medicine had the goal to avoid total financial dependence on government health authorities. But this is the economic conflict, not the politics behind it. This conflict wasn't only enacted on market arenas, but also on legislative arenas, not as buyer and seller but as executive government versus interest group. Here, professional autonomy doesn't translate as political influence. Strikes from the medical class are not a guarantee of success as politicians are not pressured by them - voters tend to blame doctors, not politicians (IMMERGUT, 1992).

The role of government in financing medical services can be divided into three types of government programs that trace back to the welfare models, from least to most interventionist, with implications for governmental regulatory capacity over the health system (IMMERGUT, 1992).

(i) Mutual fund subsidies:

It's the most limited form of intervention, where the role of the government is to reduce cost of the voluntary memberships through subsidies to private organisations. When regulation exists, it's restricted to insurers who opt for receiving those subsidies. While it's possible for public hospitals and employed doctors to happen, they wouldn't be related to any legislation (IMMERGUT, 1992);

(ii) National health insurance:

Government has a more active role, deciding which groups are covered by compulsory public insurance that comes from a payroll tax. This creates a pressure for government regulation of the price and availability of the services, but the mode of regulation varies from country to country. Hospitals and employment of doctors are still not public through legislation, even if they can exist (IMMERGUT, 1992);

(iii) National health service:

This is socialised medicine. Government directly provides medical services to all citizens, where they own the hospitals and doctors' offices. The modality is disliked by the doctors as they want to maintain a part-time private practice. This is close to a monopsony (IMMERGUT, 1992).

There's no ideal model. Each has its own strengths and weaknesses, and most importantly, the best model is conditional to the objective that needs to be reached. In fact, most countries have hybrid health systems, adopting tools (usually in terms of payments) from two models (TOTH, 2016; TOTH, 2020; BALI; HE; RAMESH, 2022). Health systems are also not immune to changes over time, including transitioning from one prevalent model to other.

Recent literature considers the triad model to be overly simplistic and limits classification and comparison of health systems. Most empirical literature generally focuses on two core dimensions: financing and provision/delivery arrangements (TOTH, 2016). There has been an effort to build a more sophisticated kit of descriptors, like breaking national systems into subsystems by adding new typology categories (TOTH, 2016), or adding new features to the financing/delivery dimensions, such as governance arrangements of a health system (LAVIS et al., 2012).

Albeit the theoretical exercise is valuable, the addition of even more categories hinders empirical analyses that are not deep case studies.

To be able to compare multiple countries, there should be a balance between abiding by the consistency of indicators over time and having flexibility to accommodate individual countries' interests and technical capacity, and changing needs. This usually results in using few pre-selected criteria so more countries are fit in the analysis (MARMOR; WENDT, 2012; FORDE; MORGAN; KLAZINGA, 2013). Immergut's 1992 triad model is parsimonious and works fine for my purposes.

3.2 Empirical Strategy

There's a trade-off between aggregation and granularity when comparing systems (FORDE; MORGAN; KLAZINGA, 2013) which can be partially solved by the mixed analysis. Comparing complex arrangements of various countries necessarily requires a broad focus, while implementing health policy reform requires knowledge about specific programs (MARMOR; WENDT, 2012).

A quantitative comparative study can supply a gap in descriptive time-series cross-section variation data in the levels of social protection: design, implementation and coverage, and much of the official data is contradictory with case studies data (MARES; CARNES, 2009). Empirical bias has also limited the testing of competing explanations, and health studies should take care with associations being potentially explained by case or information selection (FILHO; DIAZ-QUIJANO, 2021).

A case study, on the other hand, can be used to identify changes in the policymaking process *per se* through the trajectory of institutions and policy formulation (OLAVARRIA-GAMBI, 2021). But we also need to take care when inserting too many context details in a case study to the point that data may be too determined by country or service-specific characteristics (FORDE; MORGAN; KLAZINGA, 2013).

I'm proposing a mixed-methods approach to answer my question. There are exemplary studies in the literature with both types of analysis, which seem to be concentrated in waves (BRADY et al., 2016).

A quantitative approach can help me to uncover the big picture of implementation of preventive health policy. Besides, considering the low rate of temporal changes in institutions, comparison between settings is a more promising venue of analysis. On the other hand, a case study captures the invisible processes regarding decision-making, especially in the formulation arena. It also permits a proper historical analysis of the policy, when quantitative time-series data is not available. Hence, a mixed-methods study is ideal to address the two proposed stages of policymaking.

There are multiple possibilities of mixed-methods research design, according to the type of question and analysis one intends to do. The one I'm adopting here is the Convergent Design, whose idea is to merge results from both quantitative and qualitative analysis (Figure 2) (CRESWELL, 2015).

Figure 2 – Convergent Design - A Mixed-Methods Approach
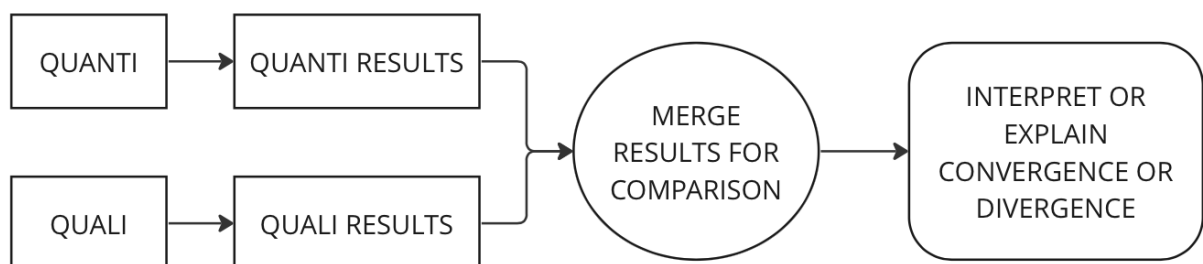
Source: Creswell 2015

Table 2 – Information for Procedures and Products in a Diagram

	Procedures	**Products**
Quantitative data collection	Participants; N; Data collection; Variables =	Database with variables/scales
Quantitative data analysis	Clean database; Input into software program; Descriptive results; Inferential results;	Statistical results in tables; Significance results, effect sizes, confidence intervals
Qualitative data collection	Participants; N; Data collection; Central phenomena	Text database transcribed for easy coding
Qualitative data analysis	Transcribing data; Coding; Themes	List of quotes, codes and theme; Possible diagram linking themes

Source: Creswell 2015

The idea of the convergent design is to conduct separate data collection and analysis of both methods (Table 2), and then merge results so the same phenomenon can be studied from different perspectives. Summing up data generates a more complete understanding of the question (CRESWELL, 2015).

I'm choosing Latin America as my object, for a few reasons. First, findings in literature tend to focus on rich and industrialised countries, mainly Western Europe and US, where a clear bias for old democracies with high public spending could be affecting the results. The few studies that take LMIC as the subject reach different conclusions. In fact, many studies can only explain variation in social policies if developing nations are not included (MARES; CARNES, 2009).

Second, LMIC in Latin America not only have shared economic history that has engendered path dependence on social policies design (MARES; CARNES, 2009), but they also present similar pattern of diseases outbreaks, as they are still working towards an epidemiological transition, which has already happened in Europe.

When dealing with institutional settings, the main analytical concern is the potential endogeneity in causal inferences. The best strategy to correct that is using historical analysis

(SPILLER; STEIN; TOMMASI, 2003), which not only manages this issue, but also incorporates the path dependence effects that are predicted in the theoretical framework. The research design for this stage can be found on chapter 5.

Country selection was due to availability of the dependent variable (more on that later in this section): **Brazil, Chile, Costa Rica, Dominican Republic, Mexico, Paraguay, Uruguay**.

For the case study, I'm choosing the **Dengue Fever Prevention Policy** in Brazil as my case. The first criterion was the type of health risk. For the most part of LMIC, infectious diseases are still the default issue for epidemics, as they are historically associated with social structures and environmental factors that became obsolete in rich and industrialised countries (SUNDIN; WILLNER, 2007). More details on that on chapter 6.

Since my quali-quanti approach have different units of analysis, I can't merge both databases or use equal sampling. This is not a methodological issue for the convergent design, as each type of data is telling me different stories, and I can still compare different perspectives from the conclusions I take (CRESWELL, 2015). I maintain the same timeframe for both samples, though.

3.2.1 Operationalisation

Health systems

Although the governmental intervention model is adequate to capture the resilience of the health policy structure, I can't ignore how in practice there's hybridisation and changes over times. There are two analytical implications: first, if I use this concept as a categorical variable, I would need to make a choice for the prevalent model, making the classification prone to measurement errors; second, I would need to go through the history of each country and classify each unity in time, requiring way more research effort than attainable for a comparative study.

My strategy then is to operationalise government intervention as a continuous variable, opting for one of its core dimensions: financing.

I'll be using SHA's classification of healthcare financing schemes. The key aspects of a health financing system are the *financing schemes*, categorised by the arrangements through which health services are paid and obtained by people. The financing scheme builds the functional structure of a country's health financing system; *types of revenues*, meaning the mix

Table 3 – Classification of health care financing schemes (summarised)

Code	Description
HF.1	Government schemes and compulsory contributory health care financing schemes (Includes central/sub-national government schemes; social health/compulsory private insurances; compulsory medical saving accounts)
HF.2	Voluntary health care payment schemes (Includes government/employer/community based insurances; non-profit and resident foreign agencies schemes; enterprise/healthcare providers schemes)
HF.3	Household out-of-pocket payment (Includes with or without cost-sharing with government schemes or voluntary insurances)
HF.4	Rest of the world financing schemes (non-resident) (Includes compulsory and voluntary schemes; philanthropy/foreign development agencies)

Source: OECD; Eurostat; World Health Organization 2017

of sources for each financing scheme; and *institutional units*, the agents that play the role of providers of said revenues (OECD; Eurostat; World Health Organization, 2017).

To classify a financing scheme, the main criteria used, in simple terms, are the mode of participation by citizens (automatic, mandatory, or voluntary), the benefit entitlement (contributory or not), basic method for fund-raising (public budget revenues, compulsory per income, voluntary payment, donations or subsidies), and pooling (national, sub-national, specific schemes or programs, or individual level) (OECD; Eurostat; World Health Organization, 2017).

The main accounting categories (sub-categories not included) are described on Table 3.

SHA's categories are very detailed, but I don't need to go down on this level of information. The classifications in accordance with the categorical theories of governmental intervention are "government financing arrangements", "compulsory contributory health insurance schemes", and "voluntary financing arrangemnts". Not only they're more compatible, but they also correspond to most if not all of health expenditures in the selected countries[1], as plotted in Figure 3.

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[1]   I opt for not showing data of out-of-pocket and rest of the world financing schemes, as they're not theoretically nor empirically relevant in my cases. Data for those schemes are available in the same sources. Hence, the following descriptive plot doesn't reach a 100% sum

Figure 3 – % of Current Health Expenditure by type of financing scheme (2000-2020)

Indicators ● Compulsory contributory health insurance schemes ● Government schemes ● Voluntary health care payment schemes
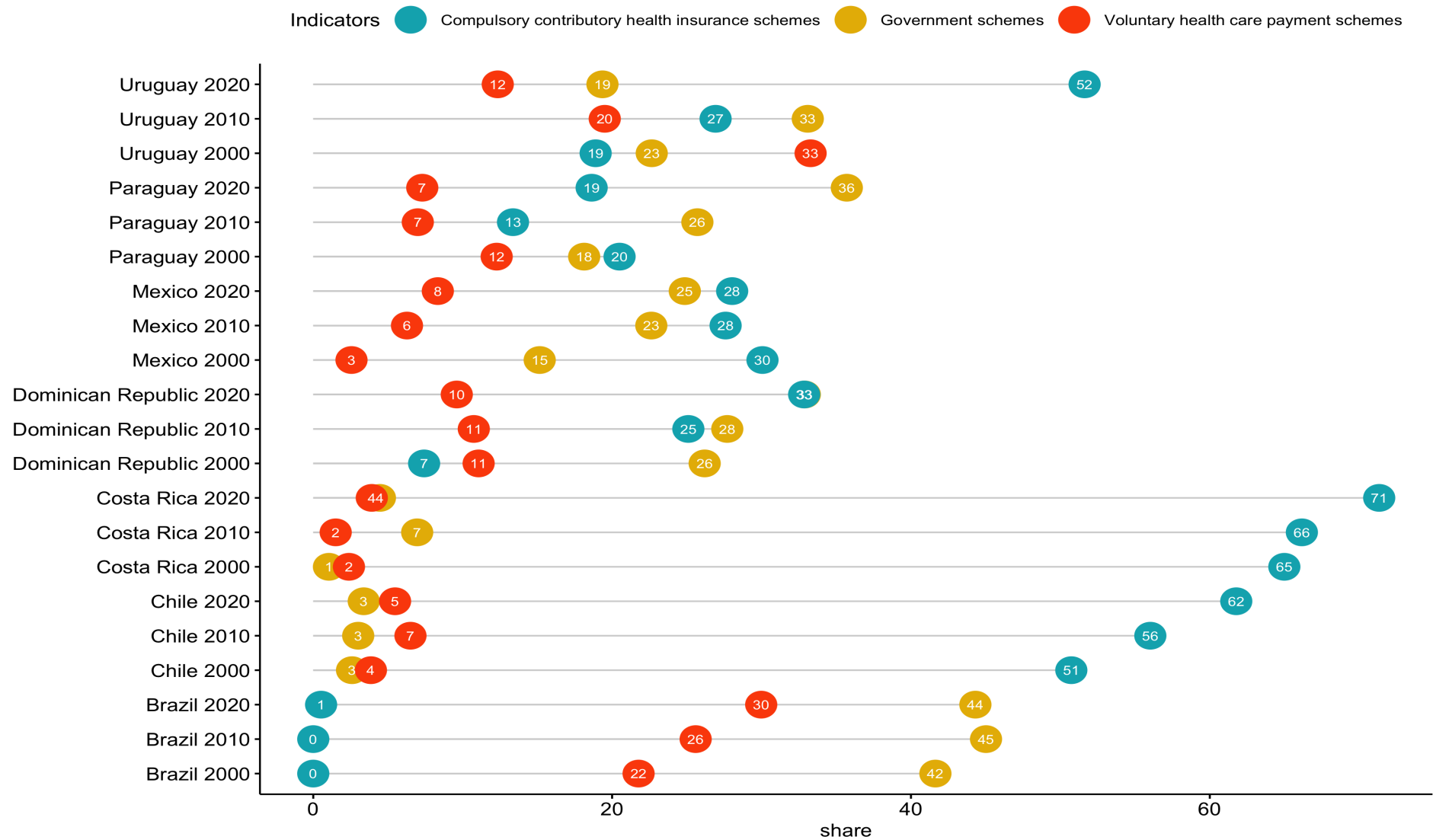
Source: Author's elaboration from PAHO data

Table 4 – The classification of health care functions at the first-digit level

Code	Description
HC.1	Curative care
HC.2	Rehabilitative care
HC.3	Long-term care (health)
HC.4	Ancillary services (non-specified by function)
HC.5	Medical goods (non-specified by function)
HC.6	Preventive care
HC.7	Governance and health system and financing administration
HC.9	Other health care services not elsewhere classified (n.e.c.)

Source: OECD; Eurostat; World Health Organization [2017]

To transform the concept in a continuous variable, I'll pick the proportion of government financing arrangements in the current health expenditure of each country-year. The closer the proportion is to 100%, the greater is the role of the government in the financing scheme, meaning we are observing more intervention. This choice supports my hypothesis, as I expect national health systems to be more associated with emphasis in prevention

Prevention

It's common to associate primary healthcare with preventive policy, but note that those are distinct categories of policy. Primary care is difficult to define, since it's different for each country (VENGBERG, 2022). Primary care treats the patient as a whole, like a generalist care, instead of specific diagnoses or conditions. It is directed to common problems, involving preventive, curative, supportive and rehabilitative healthcare services. The approach of action is multisectoral, integrated, and seeks to empower people and communities. Examples of primary care services are triage, diagnostic services, treatments, follow-up care, health promotion and reproductive health. The types of services available in each healthcare system varies (WHO, 2022b; VENGBERG, 2022).

Primary care and preventive care have some overlap areas, and some exclusive services. The overlap is not enough to use the concepts as interchangeable, though.

SHA groups healthcare goods and services in the so called *healthcare functions*, using their purpose as the main criterion, as described on Table 4 [2].

The big group of Prevention can be broken down in classes:

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2   There's no HC.8 group of functions.

Information, education and counselling programmes. It wants to encourage a process of learning so people are empowered to make their own decisions about their behaviours and the way they use the health system. These programmes can be disease-oriented (trying to control it), or can be related to risk-avoidance, or even self-applied monitoring of health conditions (OECD; Eurostat; World Health Organization, 2017);

Immunisation programmes. Primary prevention in the most basic form, as it tries to prevent the development of a disease before or after exposure to it. Immunisation can happen continually or for specific events. The consultation that leads to it should also be accounted for (OECD; Eurostat; World Health Organization, 2017);

Early disease detection programmes. Active search of disease before symptoms appear, through screenings or tests. Control and follow-up exams are considered curative care (OECD; Eurostat; World Health Organization, 2017);

Healthy condition monitoring programmes. Active monitoring of health conditions without focusing on specific diseases, generally within risk groups (OECD; Eurostat; World Health Organization, 2017);

Epidemiological surveillance and risk and disease control programmes. Planning, monitoring and evaluation of outbreak interventions, including the production of information that guides decision-making (OECD; Eurostat; World Health Organization, 2017);

Preparing for disaster and emergency response programmes. This class varies across countries, since health risks are particular to some areas, whether of human or natural origin. Preparedness aims to reduce mortality and morbidity [3] (OECD; Eurostat; World Health Organization, 2017).

To detail those types of services is important when distinguishing preventive to non-preventive spending - and by consequence this affects the allocation of costs and resources. In case of doubt regarding some activity, the general guideline is to verify its primary purpose - if it doesn't fit the prevention criteria, it should be excluded from the aggregation of data. For example, analysis of risks for human safety may fall under the prevention lane, but regulation of safety equipment or warnings are considered Governance (HC.7). Expenses with pharmaceuticals, even if preventive (like anti-hypertensives), will be moved to the Medical Goods category (HC.5) (OECD, 2017).

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[3] Mortality data refers to having a default declaration of death. Morbidity data refers to the group of diseases and general malaise in a population (FILHO; DIAZ-QUIJANO, 2021)

To operationalise emphasis in prevention I'll simply use the ratio between curative and preventive expenditures of a country.

3.2.2 Studying Latin America

Historical trajectory: economy, democracy, and welfare state

Economic models have a direct impact on policymaking, since they shape the types of decisions policymakers can take and which policies they can implement (THORP, 1998). Let's start the digression in time from the end of the nineteenth century and follow the timeline.

The economic model predominant in Latin America was the exports model, having commodities as the main product. The competition conditions made a huge difference in profits between products from temperate and tropical areas (BéRTOLA; OCAMPO, 2012). Brazil had an internal competition between southeast coffee and northeast sugar, the first being the eventual winner by destroying the Atlantic environment and paying next to nothing to workers, which worked macro-economically as the country size provided the market. Mexico arrived late to the exports in an indirect and violent version, creating growth and institutional development, and changing both the State and civil society. Chile adopted ore exports model, while Caribbean countries (like Dominican Republic), had sugar economies mainly controlled by the US. Smaller economies, like Uruguay, Paraguay and Costa Rica, dealt with an also small market, lack of national integration and limited resources (THORP, 1998).

By the end of the nineteenth century, after processes of political and institutional changes and abolishing slavery, LatAm was moving away from other developing regions, while, simultaneously, inequalities increased (BéRTOLA; OCAMPO, 2012).

Most LatAm countries were incorporated into the global economy during the commodities export model, which coincided with the beginning of the welfare state. Health benefits of this time were basic sanitation and vaccination campaigns for urban areas, financed by general taxes, and collective hospital benefits for the general middle class financed by private philanthropy (VIANA; FONSECA; SILVA, 2017).

Although growth by exports has the good outcome of creation of institutions and infrastructure, and the development of a relationship between private and public sectors, it also has a downside - vulnerability to external shocks and dependence on imports. This is what happened

after the world wars and consequent constant falls in the commodities cycle (THORP, 1998; BéRTOLA; OCAMPO, 2012).

From 1945 onward, State becomes a central actor in leading LatAm's industrialisation process, using new institutional tools to implement public policy, which was necessary for those economies if they wanted to start exporting (THORP, 1998; BéRTOLA; OCAMPO, 2012).

The Imports Substitution had dual health systems (combined public health services with pension system). There was investment in universal infrastructure and sanitary campaigns, and expansion of the public hospital network for primary and tertiary services for workers and lower classes through general taxes; medical assistance through private contribution and State subsidies for middle classes and formal workers (VIANA; FONSECA; SILVA, 2017).

Interventionism in foreign trade and industrialisation became a common choice for policymakers during the World War II. This choice wasn't between state intervention or return to past liberalism, but between central planning and the creation of mixed economies with moderate intervention. LatAm opted for less State, a trend that didn't make the region reach the autonomy achieved by Japan and Korea (THORP, 1998; BéRTOLA; OCAMPO, 2012).

The hindering factor was the unequal distribution of wealth, especially in land property. Reforms wouldn't solve this issue and the power structure limited other areas of policymaking. Central America, the Caribbean and countries like Paraguay, Bolivia and Ecuador had low industry share in the GDP and it didn't grow in this time. Brazil, Chile and Mexico were the leaders of the imports substitution process (THORP, 1998; BéRTOLA; OCAMPO, 2012).

However, fiscal gaps weakened the growth in some of these countries. Imports were still high and increasing, while agriculture and the domestic market couldn't keep up with the growing demand for food. Receiving foreign investment (especially between 1973 and 1981) and limiting State intervention wasn't enough to develop national systems of innovation, or to improve the education system (THORP, 1998; BéRTOLA; OCAMPO, 2012).

Because of the fiscal gaps and international debt, the space for public policy to solve these issues was too narrow. Impressive growth and institutional changes were insufficient facing the fact that imports substitution and industrialisation process reinforced a social and economic system extremely unequal for women, indigenous people, and low-income workers, and created new inequalities (THORP, 1998; BéRTOLA; OCAMPO, 2012).

Inequality is the permeating rock in LatAm's path to citizenship. Contrary to liberal economy's expectations of inequality bringing competition and development, in LatAm it's

highly associated to the causal chain of economic stagnation: asymmetric investment in education → makes taxation difficult → economic crises (SáNCHEZ-ANCOCHEA, 2020).

Democratic political systems in LatAm were weakened by inequality. Economic elites supported authoritarian regimes in the second half of the twentieth century to avoid threats to their status quo - consider how in the 1930s the level of inequality in the US, France and Brazil was very similar. Political institutions that produce public policy nowadays are still residual of the predatory authoritarian policymaking process in which they were then designed, to use power resources to condition the market and redistribution. Institutional changes and left-wing policies weren't able to break the unequal distribution cycle, neither solve the social costs (SOUZA, 2018; SáNCHEZ-ANCOCHEA, 2020).

LatAm elites were able to make their interests prevail in reforms by using structural (inherent market benefits) and instrumental (relations with key actors and policymakers by using all types of resources) powers to influence policymakers and shape policy outcomes (FAIRFIELD, 2015).

The distribution of formal policymaking authority is crucial in this framework, since it determines the extent of agenda space elites have to influence reforms.

In the 1980s there's a diffusion of economic reforms ensuing the Washington Consensus, with heterogeneous results between countries. The consensus was a list of ten recommendations of macroeconomic (fiscal prudence and monetary restriction) and structural (opening to trade and investment) aspects. The general goal was to control inflation, reduce crises, and move away from the closed model of State intervention (FRAGA, 2004).

Between 1978 and 1992, LatAm goes through a burst of democratisation, the most extensive and longest so far in the region. Democracy as a regime persisted, even if the politics inside the regime were unstable (MAINWARING; PéREZ-LIñáN, 2005).

The fiscal restrictions and limits to government's expenditures in the 1970s reverberated in the social policies features: based on demand, decentralised, private providers and competition are incorporated. WHO and World Bank formulated guidelines for developing countries about health systems during these times. Private contributory insurances for middle class expanded, while upper classes used direct out of pocket payments for high quality services, and rural and lower classes were targeted for expansion of primary healthcare financed by taxes (VIANA; FONSECA; SILVA, 2017).

Health sector's paradigmatic structural reforms were trying to fix the corporative model of industrialism in the beginning of the twentieth century (GIOVANELLA; ALMEIDA, 2017).

There was improvement in social indicators of health and education, and also reduction of inflation and bank crises. Reduction of poverty varies in the region, income distribution becomes more unequal and while there's no evidence on wealth distribution, it's assumed it followed the same path (FRAGA, 2004; OCAMPO, 2004).

Macro-economically, while the 1990s were better than the previous decade, it was still unstable, without an investment position, and going through crises. Microeconomic reforms reduced trade taxes and the control of interest rates, and implemented large privatisation. There's no evidence of what made it work in some and others not, or even if economic growth during the time is actually associated to the reforms (FRAGA, 2004; OCAMPO, 2004).

The transition to neoliberalism in the late 1980s and 1990s was an external shock to the countries in Latin America, and it left different legacies in terms of party systems (Brazil and Venezuela are examples in both extremes). In that uncertain context of crisis, the best decisions were taken by countries where the party system was programatically aligned in a left-right axis, because they created stable structures and identifiable patterns of change (ROBERTS, 2014). Chile and Mexico are the only cases where structural reforms had indisputable positive results in GDP growth, which can be explained by the relationship with populism in the region. The crises in those two countries changed the population's opinion and decreased the demand for populism, whereas where populist economic policies were adopted the inequalities remained unsolved, and health and education services were neglected by the same governments (FRAGA, 2004).

The beginning of the 21st century sees the wave of left-wing governments in LatAm, starting in 1998 with Hugo Chávez in Venezuela, followed in the subsequent years by Chile, Brazil, Argentina, Uruguay, Bolivia, Nicaragua, Ecuador, Paraguay and El Salvador. Mexico, Colombia, Peru and Costa Rica didn't have a left victory for presidency, but the leftist alternatives got stronger during the period. Incumbents achieved reelection, and by the end of the decade, two thirds of LatAm were under some sort of left-wing government. (LEVITSKY; ROBERTS, 2011).

This shift could be explained by stability and institutionalisation. The "lost decade" of neoliberalism repoliticises the discussion about inequalities, and the left articulates great opposition fronts to those reforms around the time they can compete in elections without being

a threat to democracy, by attracting broad and socially heterogeneous constituency. The success of the first governments is a sign they can keep going, reflected in the reelections (LUNA, 2010; LEVITSKY; ROBERTS, 2011).

Despite the ideology convergence, there was a certain variety of economic policies and development strategies in the 2000s. Venezuela and Bolivia go to the left populism route. Mexico and Chile adopt continued neoliberalism. In Mexico, the political system dysfunctions impeded public policies from softening negative complementarities. There are higher than average levels of education and job market regulation (same in Chile), job tenure, and unions density. Brazil and Argentina followed the nationalist developmentalism. Brazil was close to Coordinated Market Economies, where the State is a "minority partner". Education levels are low, unions have inflated volume due to being compulsory (SCHNEIDER, 2013).

Chile and Brazil are apart from the rest due to effective governance, political stability, and bureaucratic capacity. This is because in both countries the public service body has been developed since the nineteenth century, and there are institutional barriers to rent-seeking in both. In Mexico, politics are captured by companies, but the size, diversity and dynamism of the Brazilian economy make this particular practice very difficult (SCHNEIDER, 2013).

One popular similarity in LatAm in the 2000s were the conditional cash transfer programs (CCT). They were able to deal with poverty and its consequences in a cheap way, and were approved by international organisations like World Bank as strategies to reduce income inequalities and boost developing countries economies. Examples being Brazil's *Bolsa Família* and Mexico's *Progresa*, although both changed their names after 2002 (LAVINAS, 2013).

CCTs helped with inequality and poverty reduction in Brazil, but weren't enough for countries like Peru and Guatemala. There's a broad consensus that CCTs are worth implementing, but it's noteworthy they are *ad hoc* instruments that don't institutionalise rights like an universal social protection system does. The universal type of welfare state has even bigger impact on redistribution (LAVINAS, 2013).

Due to the large acceptance of CCTs, even from conservative groups, we should remember that elements from the broad political system in LatAm favours incumbents and insiders that pressure governments to sustain central economic institutions (SCHNEIDER, 2013).

Benefits, target populations and financing schemes are largely the same but expanded in the State exports economic era from the 2000s. It should be noted that hybridism permeated

in LatAm. LatAm countries are also very heterogeneous between each other, and there's no common welfare model in the region (VIANA; FONSECA; SILVA, 2017).

There are a number of typologies classifying Latin American countries in models of welfare regimes, most based on Esping-Andersen's work. The modalities in these typologies are correspondent to variations of citizenship, highlighting the consequent inclusiveness and social cohesion levels, the main challenges faced in LatAm. In reality, one can find elements of all models together in a country/society, usually pending more to one of them while dealing with stresses and contradictions (GIOVANELLA; ALMEIDA, 2017).

After 2008, many LA countries tried to fix 1980s reforms through different models, while fighting challenges from the past, like exclusion, poverty, and changes in society. The global economic environment in the 2010s has created instability, weakening of social and economic foundations, pressure for austerity, and new forms of inclusion and exclusion. The resilience of welfare systems is attributed to electoral incentives and institutional cohesion. Latin America has had some success in reducing poverty by the expansion of social protection in many forms, like pensions, CCT programs (benefits without rights), and social security. An universal system is not enough to subdue the differences of capacity to enhance citizenship and assure rights between social policies. If the system is fragmented, universal coverage will not give rights, but will preserve stratification, paternalism, discretionary selections, and insecurity. For example, CCTs for families with children require enrollment in healthcare preventive programs, but public expenditure in these areas is not a priority (GIOVANELLA; ALMEIDA, 2017).

LatAm has a preference for spending on curative care, when compared to other developing regions, like Asia and Eastern Europe. Asia spends more on basic healthcare. The vast majority of health care reforms introduced by Latin American countries attempt to increase the access of low-income groups to health services. Although means-testing limits the scope of beneficiaries of these policies (resulting in low values on the coverage dimension), these policies take high values on the redistributive dimension of the social policy space. While many countries in Latin America have privatised their old-age insurance policies, they have also introduced health care policies that explicitly provide benefits to the poor (MARES; CARNES, 2009).

Data and Transparency

The most simple and easiest to access type of health expenditure data is the aggregated by country. Table 5 has the share of health expenditures on the country's GDP, a very required information, and Figure 4 ranks the countries on it.

Table 5 – Summary of Health as % of GDP

	Countries	min	max	median	mean
1	Brazil	7.94	10.31	8.33	8.70
2	Chile	6.58	9.75	7.03	7.69
3	Costa Rica	6.56	8.02	7.59	7.34
4	Domin. Rep.	4.35	4.94	4.88	4.76
5	Mexico	4.44	6.24	5.73	5.59
6	Paraguay	4.82	7.57	6.01	6.11
7	Uruguay	7.75	9.21	8.29	8.46

Source: Author's elaboration from PAHO data

Figure 4 – Current Health Expenditure as % of GDP (2000-2020)
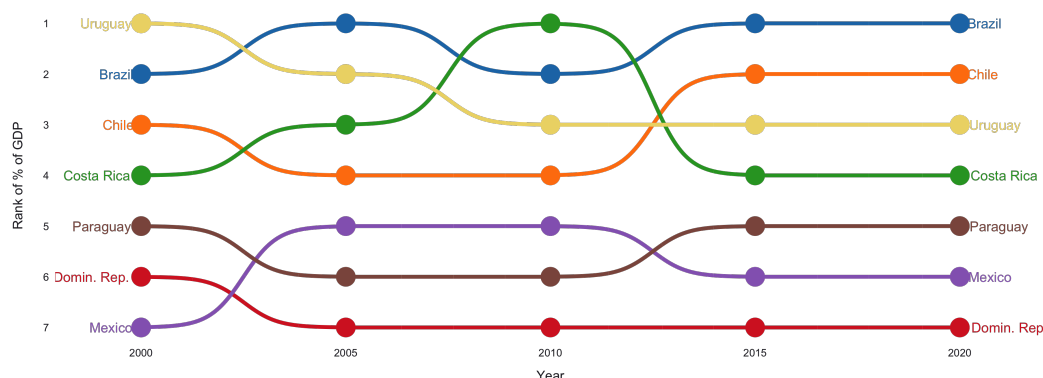
Source: Author's elaboration from PAHO data

Individual initiatives of applying health accounting to government expenditures date decades back from now in OECD countries. Comparative studies on that front started being sponsored by WHO in the 1960s, gradually expanding in coverage of countries. The first LatAm health account was developed in Mexico in 1994, and only after that a partnership between PAHO and USAID (United States Agency for International Development) supported other LatAm countries in doing the same (RATHE et al., 2018).

This type of data still faces an institutionalisation problem, especially in non-OECD and LMIC. This is not just a data collection issue, but also the continuous use of results for policymaking. It should be noted that, in OECD, much of the data production is made by a

Table 6 – Availability of information reported by the surveyed countries, 2019

Type of content	Existence in the 14 countries surveyed
Total amount of health spending and source of resources	Exists in 12 countries 2 countries did not respond
Expenditure by health providers	Exists in 12 countries 2 countries did not respond
Expenditure by inputs	Exists in 12 countries, with public sector data Exists in 2 countries with private sector data 2 countries did not respond
Health services (functions)	Exists in 11 countries Does not exist in 1 country 2 countries did not respond
Expenditures by illness	Exists in 11 countries Does not exist in 1 country 2 countries did not respond
Capital expenditure	Exists in 8 countries with public sector data Exists in 3 countries with private sector data Does not exist in 1 country 2 countries did not respond

Source: OPS/PAHO 2022, free translation

Statistical body, while LMIC leave this to Health Ministries (RATHE et al., 2018; SCHNEIDER et al., 2021; OPS, 2022).

Availability of health accounting data poses the biggest challenge when LatAm is the research object. Table 6 maps it in 2019.

In earlier years there's no disaggregated data available, and when it exists it's decentralised in sources and formats (SCHNEIDER et al., 2021). Many countries still send reports to PAHO in pdf formats, meaning the datasets are not added to the official platform, although the reports can be found in the Documentation section of the website. Most government official websites don't openly provide the data.

Going through the Access to Information route wasn't very fruitful. Some countries never responded, or they kept sending me to different paths - mostly because the official channels didn't know where the information could be stored, or if it existed. It even happened that some countries claimed the type of data didn't exist when there were national reports using

Table 7 – Data availability of Health Expenditures by Function per country

Countries	Data availability
Brazil	2010-2018
Chile	2010-2018
Costa Rica	2010-2018
Dominican Rep.	2014/2016-2019
Mexico	2003-2020
Paraguay	2012-2018
Uruguay	2017-2019

Source: Author's elaboration

the same information asked to generate descriptive graphs. WHO tracks data availability and open policy for some countries in reports called *SCORE for Health Data Technical Package - Assessment Summary*.

The existence of disaggregated data available also wasn't enough in some countries. The most popular category for disaggregation is the HF - Health Financing, for schemes and revenue sources, for which time-series of twenty years exist. In the case of Peru and Guatemala, for example, a time-series since the 1990s is produced, but only for this type of account. HC - Health Functions has only been more frequently added to accounting reports in the 2010s, or post 2016 in the case of Uruguay and Dominican Republic. Some countries, like Brazil, simply don't use the SHA aside from compiled reports sent to PAHO - disaggregated data for health expenditures is routinely produced and open, but not comparable.

The most frustrating experiences came from Mexico and Honduras. In Mexico the data is disaggregated and available on the government website - but only when using a VPN from Mexico or US territory. Honduras replied to the Information Request, but with data divided by health departments instead of functions, and so disaggregated it was unusable.

The seven countries used in this study are the ones where the adequate data could be found. This data is described on Figure 5.

While it is tempting to improve data quality by adding countries with more availability (RIC and OECD), this choice would bring an empirical bias, as the bigger volume of observations skews the found effects, as it happened with studies that tried this strategy (SCHNEIDER et al., 2021). Another potential potential issue is the regular democratic bias of analyses, since we already established that in LatAm most welfare states were implemented during autocratic periods.

Figure 5 – Time-series of Emphasis on prevention per country
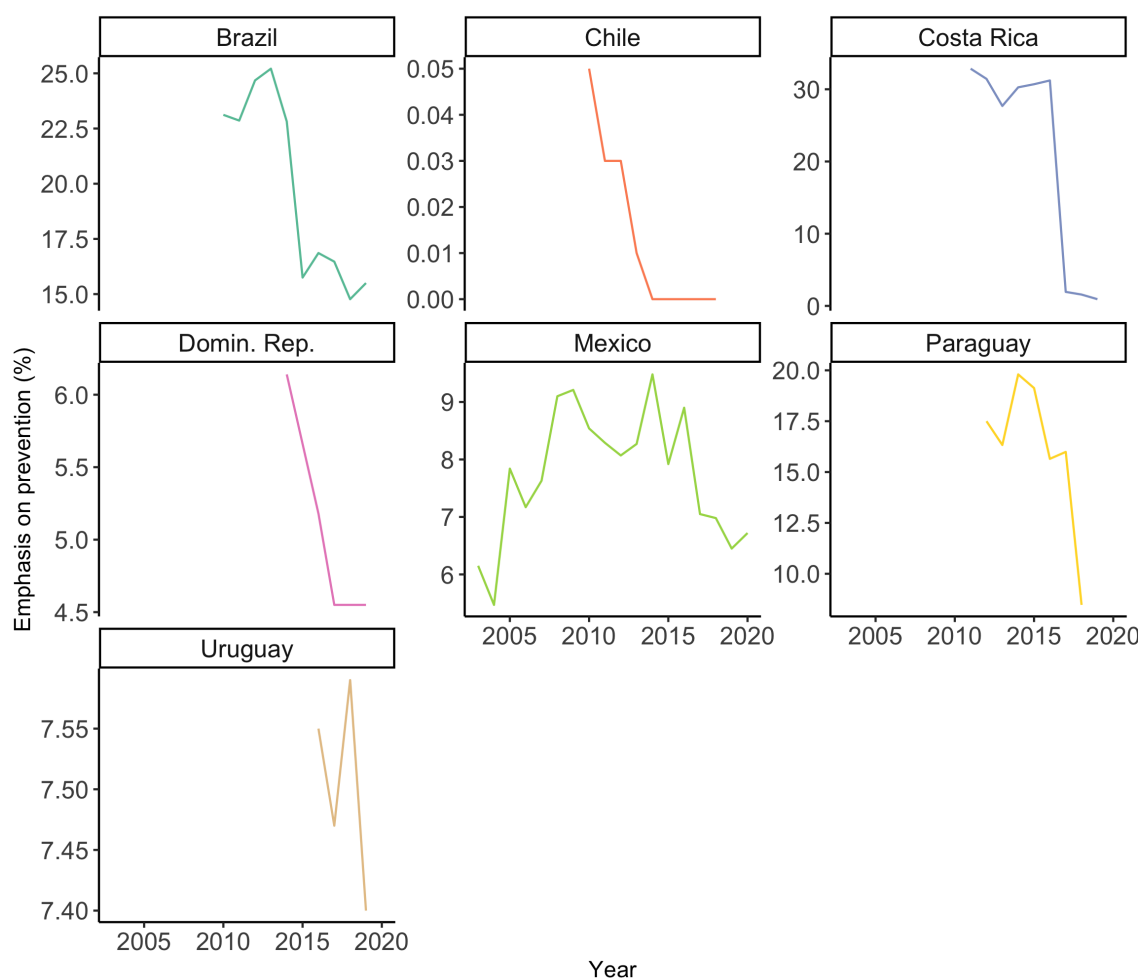
Source: Author's elaboration

3.3 Knowing my cases

3.3.1 Brazil - Sistema Único de Saúde (SUS)

Brazil has adopted a model of national health system since 1988, the first constitution after the re-democratisation. It's called *Sistema Único de Saúde* (SUS), or Unified Health System.

SUS is highly decentralised, being financed and managed by and all levels of government. Federal, State and Municipal contribute respectively a minimum of 6-7%, 12% and 15% of gross tax revenues. This includes all types of care (primary, secondary and tertiary) and covers the whole population without requiring any kinds of fees. The only exception is the People's Pharmacy Program under the modality of co-payment (PAHO, 2017; KANAVOS et al., 2019).

Primary healthcare coverage, especially in Family Health Strategy, has been expanding over the last 20 years. The proportion of the population covered by family health teams increased from 17.43% to 63.72% between 2000 and 2015. In 2016, the new National Health Plan was launched, aiming to improve the quality of universal timely care, through better health conditions, more equity and quality of life (PAHO, 2017). Expenditures with prevention, promotion and health vigilance are mostly financed by SUS (89.6%) (BRASIL, 2022).

Even with the decentralisation, many municipalities are still deprived, as the distribution of physicians across the country is unequal and concentrated in major urban centres (PAHO, 2017).

Brazil also has a voluntary-based private health insurance system and private supply of health services without intermediation, which covers about 77.5% of the population, the main beneficiaries being urban workers plans, insurance premiums and out-of-pocket payments. Some of the private providers may have contractual relationships with SUS (KANAVOS et al., 2019).

3.3.2 Chile - Plan de Acceso Universal a Garantías Explícitas (AUGE)

Chile has a dual health system, fragmented in public and private branches that are covered by the *Plan de Acceso Universal a Garantías Explícitas* (AUGE) - Universal Access Plan to Explicit Guarantees. It's also known as *Régimen General de Garantías Explícitas en Salud* (GES), or General Regime of Explicit Health Guarantees. Those health guarantees include 87 diseases [4].

The Ministry of Health is responsible for system governance and regulation, and the National System of Health Services (SNSS) coordinates the health delivery functions of the public sector. The services are decentralised and distributed with unequal availability across the country, while primary healthcare system is largely municipal (PAHO, 2017).

The public principal agent is a single non-profit public insurer and for-profit called *Fondo Nacional de Salud* (FONASA) - National Health Fund. Financing for FONASA comes from Federal funding and mandatory contributions (7% of monthly income or pension for all dependent workers, retirees and independent workers receiving social security benefits); benefiting the population from very low to higher-middle income, with free coverage to indigenous, indigent and unemployed people - 76.3% of the population was under FONASA in 2013. By

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[4] COVID-19 rehabilitation and comprehensive care in case of sexual assault were added to the list in 2022.

law, FONASA buys most of its services from public providers who are required to do that (PAHO, 2017; KANAVOS et al., 2019).

The other side are the non-profit private health insurance institutions known as *Instituciones de Salud Provisional* (ISAPRE) - Provisional Health Institutions. The beneficiaries can receive care in private or public sector, since contribution is mandatory, but the ones that voluntarily choose to be under ISAPRE (17% of the population) are required to pay 20%[5] of the costs not covered by the insurance (co-payment regime) (PAHO, 2017; KANAVOS et al., 2019).

Other schemes include out-of-pocket health expenditure, which accounts for 38% of total health expenditure and primarily affects lower-income families; and specific insurance programs such as that of the Armed Forces and universities (7% of the population) (PAHO, 2017; KANAVOS et al., 2019).

3.3.3 Costa Rica - Caja Costarricense de Seguro Social (CCSS)

Caja Costarricense de Seguro Social (CCSS) - Costa Rican Social Security Box - is an autonomous institution with constitutional rank [6], constituted with the purpose of regulating, administering and applying mandatory, solidary and universal social health insurance through the right to life (PAHO, 2017; KANAVOS et al., 2019; RICA, 2022).

The public health system is composed of the Ministry of Health (leading agency of the system), the Costa Rican Social Security Fund, the Costa Rican Water Supply and Sewerage Institute, and other public institutions charged with protecting and improving the health of the population. It provides all types of services with universal coverage (no copayments), from health promotion to palliative care. 90% of the funding for the CSSS comes from Employer/Employee/retiree prepaid contributions, while the poor engage in a non-contributory system (PAHO, 2017; KANAVOS et al., 2019).

The prepaid contributions are distributed like this: 22.9% comes from the insured's salary, 14.2% is provided by the employer, 8.25% is provided by the employee and 0.5% is provided by the State (PAHO, 2017).

Private insurance is available through the National Insurance Institute (INS), which is a government owned insurance company. (cost between US$60-130 per month per person depending on plan, age, gender, etc); beneficiaries register voluntarily and their contribution depends on the income, and employers must assume the cost of the *Seguro Obligatorio por Ries-*

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[5] Check <https://www.chileatiende.gob.cl/fichas/2464-plan-auge-ges> for more info.
[6] Ley n°. 17, 1943

gos del Trabajo - Compulsory Insurance for Occupational Hazards (PAHO, 2017; KANAVOS et al., 2019).

In 2014, 24.9% of the health expenditure came from out-of-pocket for services and drugs purchased in the private sector (PAHO, 2017).

3.3.4 Dominican Republic - Sistema Dominicana de Seguridad Social (SDSS)

Dominican Republic has an unified social security model - *Sistema Dominicana de Seguridad Social* (SDSS), and since 2014 care is based on a Primary Healthcare Strategy (PHC) and an Integrated Health Services Network led by the Ministry of Public Health. It has universal coverage, comprehensive care and gradual implementation. PHC focuses both on individual preventive and curative care over time, and community social determinants of health (PAHO, 2017).

In 2015, 65% of the population was enrolled in the Family Health Insurance system, being 47.5% covered by the subsidised regimen and 52.5% by the contributory regimen. This system includes a package of services stipulated by the national Basic Health Plan for members of the contributory regimen, and public facilities have the necessary capacity to provide them (PAHO, 2017).

In 2004, 90% of public expenditures was supported by fiscal sources and transfers of foreign origin through loans and donations. Ten years later, these funds have decreased to 59.4%. This happened due to the increased participation of the SDSS, whose affiliation and management by financing agents has increased the incidence of social contributions. Expenditures on subsidised and contributory health insurance have risen from 0.2% to 1.4% of the GDP over the last years, and external resources jumped from an average of 1.2% in 2013 to 6.3% in 2014 (DOMINICANA, 2017).

This drastic change was due to changes in the sources of financing for the National Budget, specifically after the *Acuerdo de Cooperación Energética Petrocaribe entre el Gobierno de la República Dominicana y el Gobierno de la República Bolivariana de Venezuela* (PETROCARIBE) - Petrocaribe Energy Cooperation Agreement between the Government of the Dominican Republic and Venezuela (DOMINICANA, 2017).

3.3.5 Mexico - Instituto de Salud para el Bienestar (INSABI)

In 2020, Mexico extinguished the *Seguro Popular de Salud* (SPS) - Popular Health Insurance - that had been a product of the health reform from 2003, being substituted by the *Instituto de Salud para el Bienestar* (Health Institute for Wellness). Due to the process being so recent, I'm going to compare both systems instead of just describing INSABI.

SPS was a national insurance model with premiums paid by the government. However 80% of it came from federal funds and 20% from state funds, because most people self-declared lower income than reality to be able to be exempt from the premiums (REICH, 2020). INSABI institutionalises what already happened in practice, implementing a national health system model financed by general taxes.

Under SPS, federal transfers to the states happened via the *Regimen Estatal de Proteccion Social en Salud* (REPSS) - State Regime for Social Protection in Health, state institutions separated from the state health agencies, as way to also separate finance from provision. This caused politically motivated unequal implementation between the states, when there was resistance from health workers, unions, governors or state Secretaries of Health. INSABI re-centralises this process by incorporating state hospitals and primary care clinics to federal institutions, so the funds and hiring personnel are provided straight to the facilities (REICH, 2020).

The services provided also differ. SPS had a package of services to be covered by primary and secondary level facilities, listed in the *Catálogo Universal de Servicios de Salud* (CAUSES) - Universal Catalog of Health Services. For the services in the list, co-payment wasn't required. INSABI offers universal and free services (REICH, 2020).

Private sector's role in the health system was reduced with the change. State REPSS could purchase services and supplies from the private sector, and while the delivery from private to public wasn't banned, INSABI stopped giving money, opting for providing medicines and physicians. This includes non-profit organisations, like cancer hospitals (REICH, 2020).

Lastly, regulation got stricter. In the SPS era, the states received federal funds and had a lot of discretion to spend it. The funds were conditioned to the number of enrollments to the insurance (process already modified from number of families because states used one-person families to inflate the numbers). So spending tended to be high and frequently diverted through corruption. INSABI tries get control back by directly hiring workers and purchasing medicines for distribution to the states (REICH, 2020).

It should be of note that my data analysis only covers the SPS period.

3.3.6 Paraguay - Sistema Nacional de Salud

The national health system is made up of the public, private, and mixed sectors. It operates with diverse financing, regulatory, enrollment, and service delivery modalities (PAHO, 2017; PARAGUAY, 2018).

The public sector consists of the *Ministerio de Salud Pública y Bienestar Social* (MSPBS) - Ministry of Public Health and Social Welfare; the Military, Police, and Navy Health Services; the *Instituto de Previsión Social* (IPS) - Institute of Social Welfare; the Clinics Hospital; and the Maternal and Child Health Center. MSPBS and IPS cover 95% of the population that doesn't have an insurance scheme (PAHO, 2017; PARAGUAY, 2018).

MSPBS channels institutional budgetary resources funded by general taxes to dependent establishments of provision of services, like a government social assistance scheme. This modality covers the population in a situation of poverty and those not insured under social security schemes or private insurance. Even contributors to other health insurance schemes are cared for in MSPBS establishments (PARAGUAY, 2018).

The IPS has provision of services and facilities of its own. Its resources come from three sources: from the State contribution, from wage taxes and employer contributions (private companies and State institutions), and from own revenue: financial and real estate investments, and fines and surcharges for late payment. In 2016, 18.35% of the population was insured under this scheme. Coverage only reaches affiliates (active and passive taxpayers), their spouses and the children of beneficiaries, up to 18 years of age (health services for outpatient care and hospitalization), children with disabilities for the duration of the disability and parents over 60 years of age, in a situation of economic dependence on the insured holders (PARAGUAY, 2018).

Local governments receive revenues from the General National Budget, and should employ 10% to social expenditures. However, they have autonomy to not specify how much of that goes to health, which makes it difficult to estimate their contribution (PARAGUAY, 2018).

The private sector includes nonprofit and for-profit organizations. Total health expenditure in 2014 was 7.7% of GDP (54.3% financed by the public sector and 45.7% by the private sector), but only covers about 0.64% of the population (PAHO, 2017; PARAGUAY, 2018).

The system covers less than 30% of the population with primary healthcare. Family Health Units (USFs) were created by MSPBS in 2008 to improve access to primary care and services. By the end of 2015, there were 754 USFs, and by the end of 2016, 796. The National Health Information System (SINAIS) has developed the epidemiological information system; the economic, financial, and administrative information system; the sociodemographic information system; and the clinical information system (PAHO, 2017).

3.3.7 Uruguay - Sistema Nacional Integrado de Salud (SNIS)

Uruguay's *Sistema Nacional Integrado de Salud* (SNIS) - National Integrated Health System, is a dual system created by Law in 2007 that integrates public and private providers. The system is financed by the mandatory *Fondo Nacional de Salud* (FONASA) - National Health Fund, and covers about 73% of the population (PAHO, 2017; KANAVOS et al., 2019).

It works like this: Users pay FONASA for income and family coverage (household and companies contributions) → FONASA assigns resources to institutions (public and private non-profit) included in SNIS for health fees, healthcare goals and *capita* (age, sex) → Institutions provide comprehensive care (PIAS) → Users have free choice on the institutions (PAHO, 2017; KANAVOS et al., 2019).

There is private health insurance, mostly paid out of pocket by voluntary or private providers (KANAVOS et al., 2019).

Health expenditure grew (share of GDP and per *capita*) between 2007 and 2014. The management and care model has shifted from a curative to a preventive model, based on the principles of primary health care. Funding incentives have not been sufficient to produce significant movement toward a health care model that provides uniform quality of care for the entire covered population (PAHO, 2017).

4. BUILDING A POLICYMAKING STABILITY INDEX

In chapter 2, I presented the group of indicators I believe are representing the stability of policymaking arrangements. They were chosen through theoretical foundations on the effects of specific institutional settings, and are summarised in Table 8.

Not only this is a significant set of variables, but also in chapter 3 I explained how the size of my dependent variable dataset is at the limit of adequate. Since this group is meant to express the same mechanism of policymaking arrangements, I decided to have them all represented in a composite index of Policymaking Stability. To build it, I take the approach of data reduction through Principal Component Analysis (PCA). This technique is a type of factor analysis, and it detects the structure of the relationship between variables, using it to transform a big group into a smaller set of latent unobserved variables (HAIR et al., 2005).

Many political science works use PCA without relating variables to a theoretical concept of interest, nor hypotheses on the variables' relationships, merely trying to reduce structure with

Table 8 – Indicators of Policymaking Stability

Indicator	Unit	Source
Party system institutionalisation		
Lower chamber seat volatility	*%*	Latin American Electoral Volatility Dataset 2021
Legislature capabilities		
Lower chamber committees	Interval 0-3	Varieties of Democracy 2021
Lower chamber introduces bills	Dichotomous	Varieties of Democracy 2021
Confidence in the Congress	% Mean	(LATINOBARóMETRO,)/ World Values Survey 2014
Cabinet politics		
No. of Parties	Count	WhoGov dataset 2020
No. of Ministers	Count	WhoGov dataset 2020
Average tenure of minister	Mean	WhoGov dataset 2020

Source: Author's elaboration (2023)

no substantive rules (MARTIN; VANBERG, 2011). This is not my case, once all the methodological procedures I conduct are guided by my theoretical expectations. The relationships I expect from these variables were set in chapter 2.

While it could be possible to extract a single dimensional index from the PCA, I don't expect this to be the case for my concept. There may be underlying dimensions, since I'm not talking about a single arena with the same rules.

Let's follow the analysis in six steps:

4.1 Step 1: Missing Data Imputation

My chosen timeframe for the independent variables is 1990-2018, where they're measured per year, adding up to 176 observations. Starting on 1990, the only variables with missing data are volatility and confidence in the congress.

For volatility, this happens simply because it's a concept only measured in election years, dependent on the existence of a previous election, working in electoral cycles. My choice here was to repeat the measurement for all the rows inside each country year range. The dataset was compiled until 2018, while some countries have DV available data from 1 to 3 years after that. In these years I also repeated the last volatility measure.

Confidence in the congress is a survey ordinal variable, measured from 1 to 4. To transform it into an annual value per country, I scaled it to 0-100, and calculated the mean for each country by year.

For confidence in the congress, the missing data wasn't so systematic. For the recent years, Latinobarometer[1] simply didn't conduct surveys (2012, 2014, 2018 and 2019). In these cases I just repeated the previous year measure. For the beginning of my timeframe, the survey didn't exist (it started in 1995). Also, Dominican Republic wasn't introduced in the survey until 2004. To increase data volume, for the time before 1995 I used World Values Survey Wave Two, in which only three countries were approached (Brazil, Chile and Mexico). Since it's only one survey per wave, I repeated the mean for each year of the wave.

In the Wave Three (1994-1998), Dominican Republic is also included - being the only time this country appears in this survey. For the years of this wave, I repeated the mean of the survey. Dominican Republic only appears again in 2004, in the Latinobarometer survey. So, for

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[1] Latinobarometer was used for its extensive time-series. However, I do not recommend using this survey if possible to dodge it, due to its frustrating inconsistency of coding.

the year range of 1999-2003, I calculated the mean of the 1998 survey and the 2004 survey, and used this measure repeatedly.

4.2 Step 2: Adequacy tests

Before actually running a PCA, we need to know if the data is adequate for such procedure. For that, I conduct adequacy tests. These tests check for factor analysis' assumptions in my sample, to guarantee they're being followed. The tests identify if correlations between variables exist, if there's an actual latent structure between them, and for homogeneity of the sample related to the latent factor structure (variables can't cancel each other by definition) (HAIR et al., 2005).

Since there are multiple units of measure among the indicators, a matrix of correlation will be used for the analysis, instead of a matrix of covariance. I'm not doing Bartlett's Sphericity Test because there are variables with ordinal and dummy measures, meaning they can't be spherical - Bartlett's test also requires a matrix of covariance.

So, I initially check for correlation between variables, on Table 9. Ideally, there should be a minimum of 0.3 of correlation for the individual pairs. This requirement is fulfilled by six pairs and all of them are significant considering a minimum p-value of 0.1. Other five correlations are significant, but they don't reach the necessary magnitude.

Table 9 – Correlation between indicators

	volatility	committee	bills	confidence	n_minister	average_minister	n_party
volatility	1.00						
commitee	**-0.30*****	1.00					
bills	0.19***	**-0.33*****	1.00				
confidence	-0.28***	0.17	-0.11	1.00			
n_minister	-0.11	0.25**	0.20	-0.20	1.00		
average_minister	-0.21	-0.11	**0.30*****	0.08	0.11	1.00	
n_party	-0.16**	**0.37*****	**-0.41*****	-0.23	**0.59*****	-0.15**	1.00

Source: Author's elaboration (2023)

Table 10 – Adequacy tests for PCA

	KMO	MSA
Overall	0.59	
Volatility		0.62
Committee		0.64
Confidence		0.50
N. of ministers		0.63
N. of parties		0.57

Source: Author's elaboration (2023)

I conduct two tests: Kayser-Meyer-Olkin (KMO), and Measure of Sampling Adequacy (MSA).

KMO test says that only five of those seven variables are adequate to include (test value above 0.5), so I drop Average Tenure of Ministers and Lower Chamber Introduces Bills. From this, the overall measure of the dataset becomes 0.59 (Table 10), meaning it's good enough for a PCA. After that, the MSA tells me that all the variables are between 0.50 and 0.64 (Table 10). While it's sufficient to run PCA from the MSA, I should note that this is considered a mediocre result. From Social Sciences, however, tests are usually not as high as the expectation built from natural sciences values.

4.3 Step 3: Running on new data

I proceed with the analysis with only five variables. PCA evaluates the structure of the variables by telling us which relationships are stronger in groups of variables called dimensions, or components. First I look at the *eigenvalues* of each dimension (Table 11).

The goal is to reduce data and discard as many dimensions as possible. If a dimension has an *eigenvalue* greater than 1, it should be kept. Another point is to evaluate how much variance each dimension is explaining. The first one always explain the biggest amount, and the others follow decreasingly. How much variance one is comfortable with keeping is subjective to the researcher. The first two dimensions in my PCA not only have a good *eigenvalue*, they also have a cumulative variance of 67.82%, which is good enough even for some natural science studies.

A second way to evaluate this choice is visually, through a scree plot (Figure 6). When the curve is steep, it means there's significant variance being explained by the dimensions (Dimensions 1 and 2). When the curve starts to flatten, there's not much being added in those remaining dimensions.

Table 11 – Eigenvalues of each dimension

	eigenvalue	% of Variance	Cumulative Variance
Dim. 1	1.94	38.96	38.96
Dim. 2	1.44	28.85	67.82
Dim. 3	0.66	13.37	81.2
Dim. 4	0.55	11.19	92.39
Dim. 5	0.38	7.6	100

Source: Author's elaboration (2023)

Table 12 – Communalities: loadings for 5 components

	RC1	RC2	RC3	RC4	RC5
Volatility	-0.07	-0.14	<u>0.98</u>	-0.14	-0.05
Committee	0.17	0.10	-0.14	<u>0.96</u>	0.11
Confidence	-0.12	<u>0.97</u>	-0.15	0.09	-0.10
N. of ministers	0.28	-0.10	-0.05	0.11	<u>0.95</u>
N. of parties	<u>0.92</u>	-0.13	-0.08	0.19	0.31

Source: Author's elaboration (2023)

Figure 6 – Scree Plot
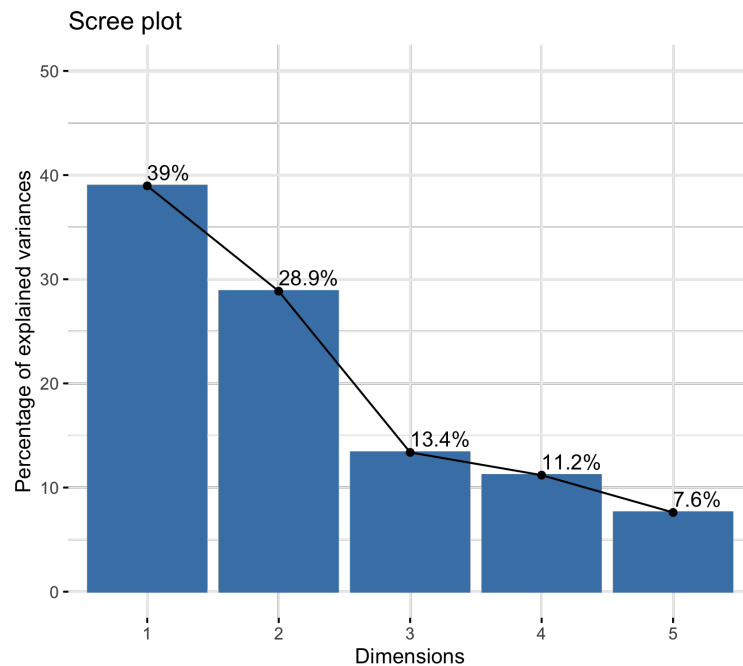
Source: Author's elaboration (2023)

It's also important to know the individual behaviour of the variables in each dimension, and there are different ways to do that. Communalities (sum of the squared loadings) evaluation is one part of interpreting the factor matrix results. They were rotated using the varimax method. Analysing the 5x5 pattern matrix based upon the correlation matrix (Table 12), I can see that each of the five variables has a standardized loading of at least 0.9 in a factor. This means their contribution for factor loading is significant, as the minimum acceptable is 0.3. When reducing to two dimensions (Table 13), the loadings are kept at a significant value of importance, and the variables have bigger factor loadings in the dimension they contribute most.

$h2$ is the actual communality, or the amount of variance in the variable explained by the (retained) factors. It is the sum of the squared loadings. $u2$ means uniqueness, and it is

Table 13 – Communalities: loadings for 2 components

	RC1	RC2	h2	u2
Volatility	-0.14	**-0.76**	0.60	1.1
Committee	**0.46**	0.62	0.60	1.8
Confidence	-0.43	**0.73**	0.72	1.6
N. of ministers	**0.83**	0.02	0.70	1.0
N. of parties	**0.88**	0.09	0.77	1.0

Source: Author's elaboration (2023)

determined by the formula "1 - h2", or the residual variance: it says how much of the explained variance is exclusive to that variable. We can also see that by the contribution of the variables for each component in Figure 7.

Figure 7 – Distribution of the variables in the components
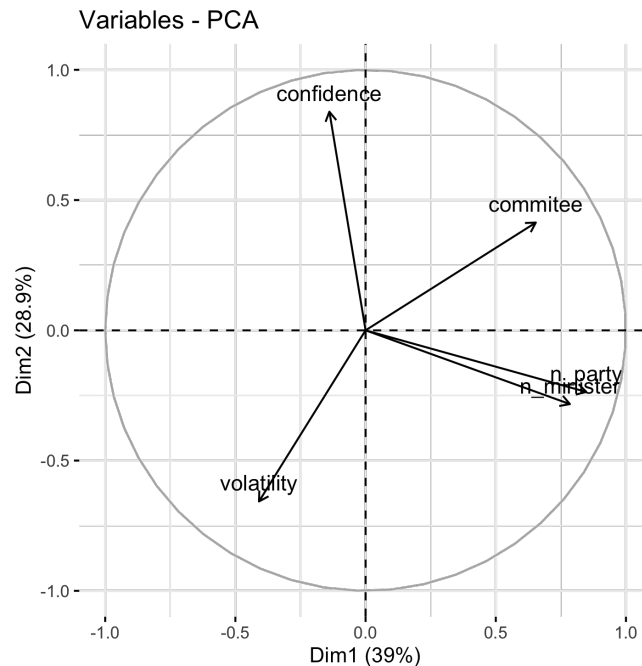
Source: Author's elaboration (2023)

The plot shows that dimension one is composed mostly of committee, number of parties and number of ministers. These last two are so correlated they overlap in representation of data. Committee is a bit further from them and is closer to the origin point, meaning the quality of representation is smaller in comparison with the others. For dimension two, confidence and volatility are in extremes from each other, meaning their relationship goes in opposite ways. This can be read in the signs of the factor loadings in Table 13. The signs mean that for an increase in the number of parties and number of ministers we have an increase in the function-

Table 14 – Contribution of individual variables in their dimensions

	Dim. 1	Dim. 2
committee	21.93	11.85
n_minister	31.59	5.55
n_party	36.87	3.87
confidence	0.99	48.80
volatility	8.60	29.90

Source: Author's elaboration (2023)

ality of the committee system. In the second dimension, for an increase in volatility, there's a decrease in confidence in the congress.

For the exact magnitude of contribution, we can see the information visually in Figure 8, or in Table 14.

Figure 8 – Distribution of the variables in the components
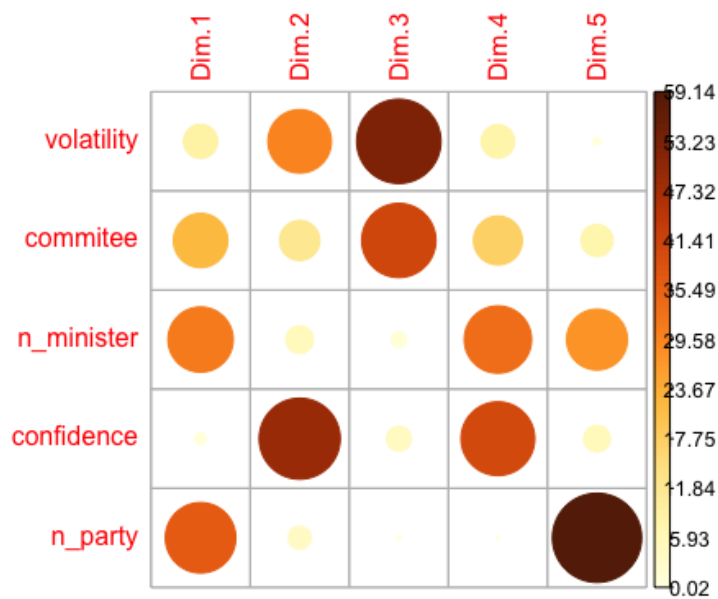
Source: Author's elaboration (2023)

The variables that contribute the most in the first dimension are number of parties and number of ministers in the cabinet, and the functionality level of legislative committees. For the second dimension, confidence in the congress and electoral volatility are the variables that contribute the most. This needs to be theoretically discussed based on my previous expectations.

4.4   Step 4: Interpreting results

As expected, Policymaking Stability is a multidimensional concept, that could be empirically described in two dimensions.

In the first dimension, there's a positive relationship between number of parties, number of ministers, and functionality of committees. Let's discuss this in two parts. First, the strongest relationship happens between number of parties and ministers, to the point PCA tells me they're almost the same variable. This is in a sense expected by office-seeking literature. Having the autonomy to do so, the chief of the Executive can increase portfolio to fit more parties in the coalition, without giving away policy from the governing party or its closest allies.

Second, the literature discussed to include the strength of the committees talks specifically about its role in monitoring coalition partners from the Legislative. Hence, the theoretical relationship is a given. As governing coalition increases, there's incentive to enhance the Legislative apparatus: not only to monitor partners, but also to monitor the government from the opposition side. This could work as a way to balance and better deal with the high number of actors.

This first component is representing a Policymaker-Policymaker dimension of stability, an **inter-institutional** relationship between the direct decision-making actors of the Executive and the Legislative, the main policymaking arenas.

In the second dimension, there's an oppositional relationship between confidence and volatility. So, as volatility increases, confidence in the congress decreases (and vice-versa). This makes theoretical sense regardless of which is the first element in a causal chain. Abrupt or constant changes in the party composition in the congress mean the party system is not institutionalised, so the population doesn't have incentive to trust those actors, as they don't have necessary time to get used to them, their positions, and their behaviour. Almost endogenously, if there isn't previous confidence in the congress, voters won't have firm preferences about the parties in it, so the support for a party isn't kept for the next election, causing a change of the legislative party composition.

This second component is representing a Policymaker-Voter dimension of stability, a relationship that is **external** to the policymaking arenas.

4.5 Step 5: Imputing PCA scores as new variables

The scores of the two extracted components are the projection of each observation value based on the factor loadings and the weight each variable has to the component. The scores become the new variable: since two dimensions came out of my PCA, the original group of seven indicators has become two new latent unobservable variables (HAIR et al., 2005).

The values originated by this calculation don't have a specific pattern, going from positive to negative without a known limit. Those numbers are arbitrary and don't have a substantive meaning except to represent the original data in a more parsimonious way. So, to facilitate interpretation of coefficients in the multivariate analysis of the next chapter, I scaled those scores from 0 to 1, using the min and max of each score column.

I should reinforce that those are arbitrary numbers that represent a distribution, not the real absolute values of the concept I'm aiming for. Using the min and max of each column has the implication that if the observation values were different - if we added new countries for example, the new variables would also have different numbers. The smallest value of this particular dataset became 0, and the greatest became 1. In other dataset, the numbers wouldn't be repeated.

4.6 Step 6: Describing results

Let's take a brief look through the general distribution of the scores for both variables. Figure 9 shows the scatterplot in which each dot represents a country in a year of the timeframe.

Figure 9 – Scatterplot of both dimensions of Policymaking Stability by country (1990-2021)
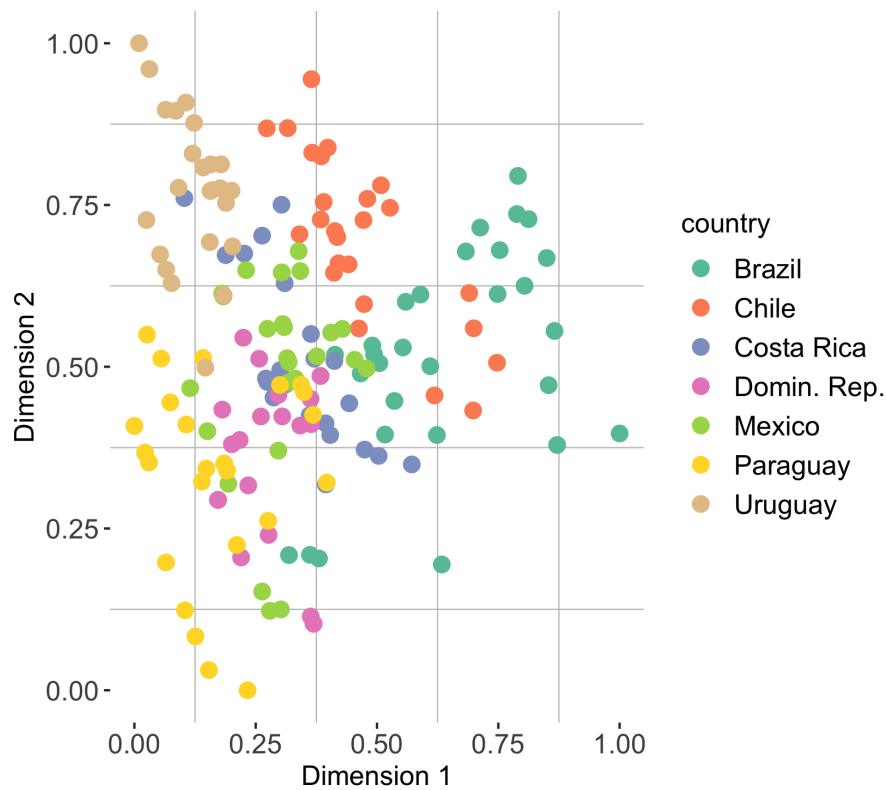
Source: Author's elaboration (2023)

First noticeable aspect is that while there are changes over time within a country, those changes tend to happen limited in an area, meaning the Stability levels are consistent. Visually inspecting, Brazil seems to be the country with more drastic changes, going from very low to very high general levels of stability on both dimensions. On the opposite direction, Uruguay is the most consistent, keeping policymaker-vote stability levels concentrated in a high position, and policymaker-policymaker stability consistently low.

Chile and Costa Rica look the best, keeping in the middle to high levels arena, while Paraguay and Dominican Republic look the worst, never leaving the middle to low levels. This resonates with the economic history of these countries raised in chapter 3, making this an empirically sound assessment.

Next, let's look at the mean values of stability per country, presented in Figure 10.

Figure 10 – Means of Policymaking Stability by country (1990-2021)
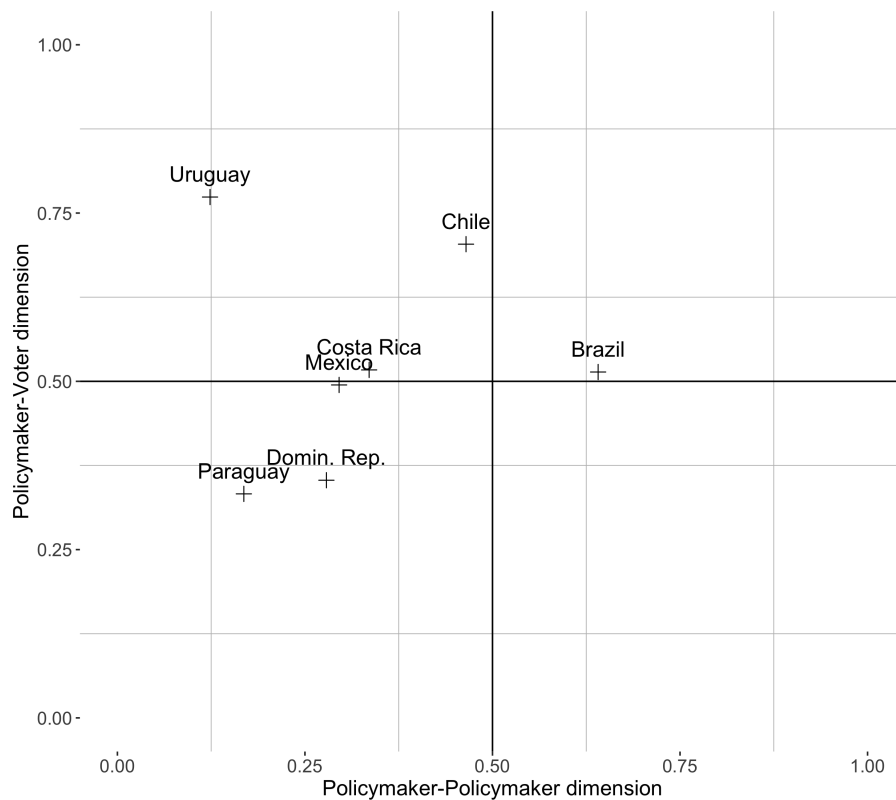
Source: Author's elaboration (2023)

It basically condensates my impressions from the distribution of these variables. Brazil fares better in the Policymaker-Policymaker dimension than its counterparts, while Uruguay and Chile have higher levels in the Policymaker-Voter dimension. Considering the nature of the dimensions, it seems Brazil is an outlier in terms of institutional setting interaction, being the only one in the right side of quadrants. Uruguay and Chile have a stronger voter connection, and the remaining countries stand on a middle ground.

This is the Policymaking Stability Index (POSTI). In chapter 5, I'm going to use its two dimensions as independent variables in my search for associations between arrangements and emphasis in prevention.

5. (PATH) DEPENDING ON THE DATA: COMPARATIVE MODELING FOR LATIN AMERICAN COUNTRIES

5.1 Recap: Hypotheses and expectations

Which policymaking arrangements are more associated with emphasis in prevention?

Reviewing chapter 2, my argument is that policymaking arrangements which feature *stability* and *resilience* promote environments with incentives to cooperation and minimisation of uncertainty, meaning they are more conducive to long-term policymaking, and by consequence, emphasis in preventive health policies.

The institutional settings that literature argues are more stable were aggregated into a two-dimensional Policymaking Stability Index (chapter 4). First dimension is called Policymaker-Policymaker, which captures inter-institutional relationships between actors from the Legislative and the Executive arenas. The second dimension is called Policymaker-Voters, representing the external relationship between parties in the Congress and the general population.

Resilience is the mechanism behind the effect of the policy structure on emphasis in prevention, and I argue for less fragmentation of structure being more resilient - thus being an incentive to emphasis in prevention. This is defined by levels of decentralisation in a country, and the model of financing scheme of the health system (a national health system has a bigger share of government financing scheme).

My control variables come straight from the literature. While they're not related to my argument, they could be having an effect according to empirical studies, which are not consistent on their direction or relevance among different political systems (check chapter 2). They're Executive Ideology (representing size of the state), where left or right cabinets vary in terms of amount of social spending; Quality of Government, by its potential impact on health expenditures; and Share of Health Expenditures on GDP, considering WHO has a recommendation of it being at least 6% and extensive literature using this variable.

I opt for not including regime type, one of the existing explanations I mention in chapter 2. As I demonstrated in chapter 3, Latin America's history of introduction of welfare states

is mingled with the presence of autocracies, defeating the main arguments of the literature. It could be argued that democratic levels change features of welfare states, but this is not my point to make.

These relations are visually summarised in my analytical model in Figure 11.

Figure 11 – Analytical Model
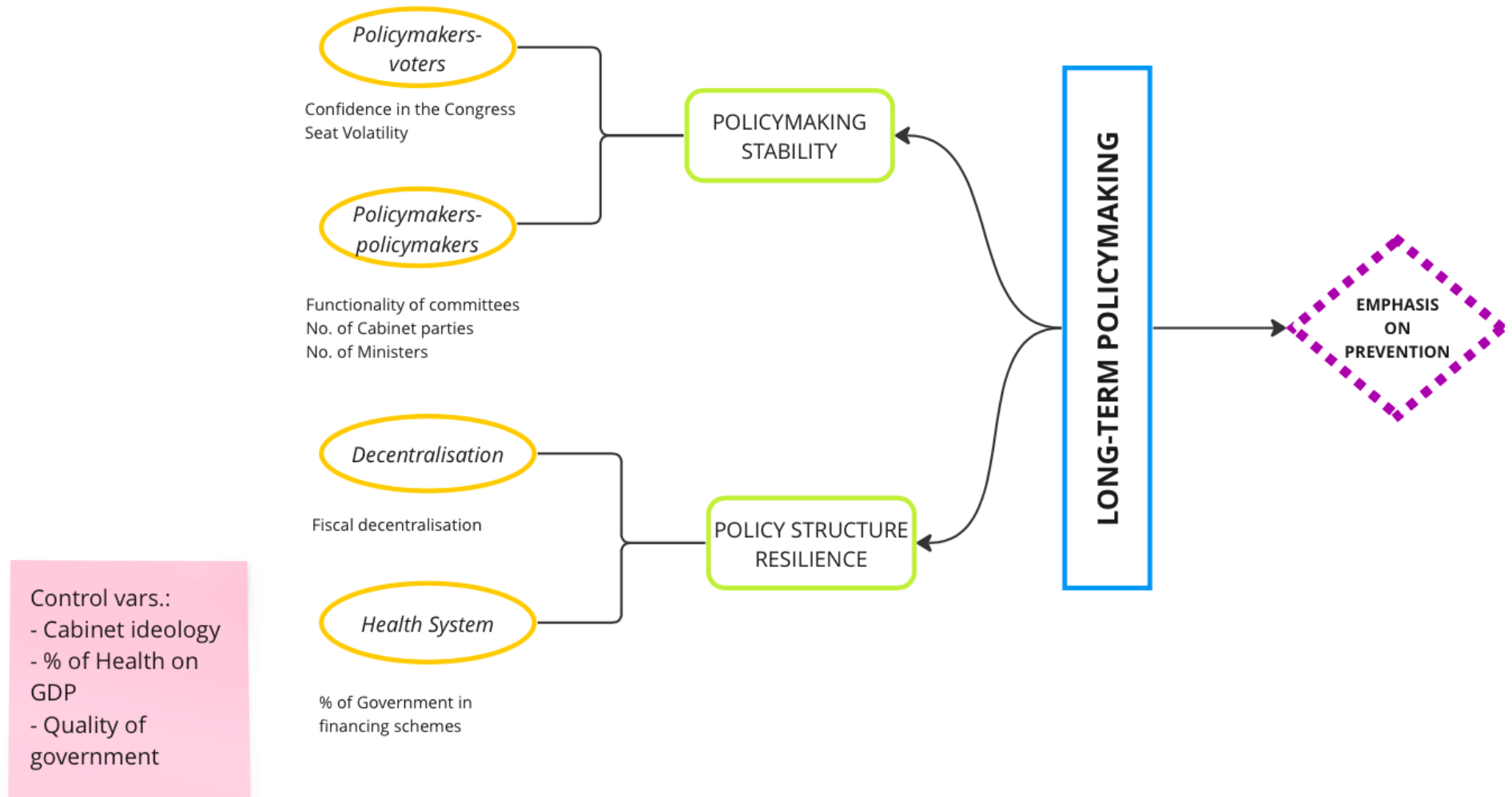
Source: Author's elaboration (2023)

My hypotheses are:

H1: Higher levels of Policymaking Stability are associated with more emphasis in prevention policies

H2: More fiscal decentralisation is associated with less emphasis in prevention policies

H3:National health systems are associated with less emphasis in prevention.

I don't have hypotheses for my control variables, and they're included at the discretion of model parsimony.

5.2   Data and methods

My research design for the variable-oriented phase of my analysis is summarised on Table 15. All the main variables of my model, dependent and independent, and the ones specifically related to health information, have been addressed in previous chapters (3 and 4).

Financing schemes is a continuous variable that indicates the proportion of one of the three financing models. My main interest is the proportion of government schemes, since greater values mean the model is closer to a national health system. However, since many LatAm countries have greater proportion of compulsory insurance schemes, I'll use the proportion for this model in parallel tests.

Fiscal decentralisation is measured by the tax revenues of the central government of each country.

As for the control variables, Executive/Cabinet ideology is a nominal variable spread in three categories: Left-Center-Right. There are five years of ideology missing data for Chile. Quality of Government is an index which scales and aggregates the indicators: corruption, law and order, and bureaucracy quality.

Except for the Policymaking Stability Index, all data comes from secondary sources. Variables basic summary can be found on Table 16.

The country-year format means I'm working with cross-section longitudinal data. While all my independent and control variables are measured since 1990, save for some missing data spots here and there, my dependent variable is very limited on timeframe availability, and this varies greatly between countries, as discussed on chapter 3. In total, I have 62 observations for my DV. When added to the few missing spots for IVs, I'll be running models ranging from 45 to 55 observations.

Table 15 – Research Design - Comparative Study

Unit of analysis	country-year
Method	Descriptive Statistics; OLS Modeling with Error-correction strategies
Variables	Dependent: emphasis on prevention Independent: Policymaking Stability Index, Decentralisation, Health System Controls: Executive Ideology, Share of Health Expenditures in GDP, Quality of Government

Source: Author's elaboration (2023)

Table 16 – Variables

Variables	**Indicators**	**Measurement**	**Source**
Emphasis on prevention	Share of Expenditures	0-1 ratio	PAHO2022a/Countries' Access to Information
Policymaking Stability	PS Index	0-1 scale	Original measure (Check Chapter 4)
Decentralisation	Fiscal decentralisation	0-1 scale	IMF2022
Health System	Financing scheme	0-100 proportion (%)	PAHO2022a
State Size	Cabinet left-right alignment	nominal	IDP2021
Health on GDP	Share of GDP	0-100 proportion (%)	PAHO2022a
Quality of Government	QOG Index	0-1 scale	QOG2022

Source: Author's elaboration (2023)

This is a modest sample size for multivariate regression analysis. However, it is still adequate, as literature argues for $n \geq 8$ when the sample has low variance, and $n \geq 25$ for high variance samples (JENKINS; QUINTANA-ASCENCIO, 2020). Due to the limited number of observations, I'll run parsimonious models - fitting my independent variables and only one control variable at a time. This way, I keep an amount of at least 10 observations per variable.

Ideally, I would model a time-series cross-section analysis. However, not only this an extremely unbalanced panel, but I also don't have even close to a minimum amount of units of time for a reliable TSCS. I can't ignore potential auto-correlation effects being omitted by the repeated observations over time (KELLSTEDT; WHITTEN, 2009), though. Budgetary data should always be assumed to have a memory of past values, as it's unusual for a government to redo it from scratch, even for non-incumbents post election.

Even if my panel is short and unbalanced, there could be a constant non-observable effect over time that ends up becoming a parameter in the model, explaining changes in the dependent variable instead of its positions. This would hurt OLS regression assumptions of normality and homoscedasticity, reflected in residual correlation, which must be controlled for (WOOLDRIDGE, 2002; PENNINGS; KEMAN; KLEINNIJENHUIS, 2006).

I conduct tests for model assumptions on Appendix A, in which I try to identify auto-correlation through heteroscedasticity[1].

From the results, while it seems it's possible to interpret coefficients of the original OLS model, there's a possibility of dependent errors, making those estimators unreliable (HAIR et al., 2005; PENNINGS; KEMAN; KLEINNIJENHUIS, 2006; KELLSTEDT; WHITTEN, 2009; MACKINNON; WEBB, 2020). Adding that up to the theoretical expectation that each country will have an omitted auto-correlation. Since I can't do a TSCS that would account for that, I'll adopt a different strategy to deal with potential correlation between errors.

If it was a problem of distribution, simple data transformation to reach normality could be applied (HAIR et al., 2005). However, this type of dependence is inherent to the data structure and the cases, so we have to use methods that adjust non-linear errors. There are two possible ways to deal with this scenario. First, we can use robust errors by calling for standard errors with heteroscedasticity. This allows for a general assumption of the model that the errors are not linear and should be corrected.

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[1] Try saying heteroscedasticity three times fast. It's almost as bad as having to write it multiple times along this chapters, which is why I eventually gave up

Second, we can cluster errors by my assumed source of auto-correlation (the countries), which is a more specified approach. Cluster-robust variance is recommended for samples with spacial/geographical auto-correlation. For panel data it should be done at the cross-section level instead of, say, country-year observation level, as the former allows for arbitrary auto-correlation of errors within the cross-sectional units, making estimators more reliable (MACK-INNON; WEBB, 2020).

5.3 Findings

For practicality, I'll keep the shortened variable names when presenting my table results. The Policymaking Stability Index is represented by its two dimensions, Policymaker-Policymaker (*PolPol*) and Policymaker-Voter (*PolVot*). Health System can be the proportion of governmental schemes (*govschemes*) or compulsory insurance schemes (*insurschemes*). Fiscal decentralisation is *taxd*.

Controls are *ideology* for Cabinet Ideology, *ratiogdp* for Share of Health on GDP, and *icrgqog* for Quality of Government.

5.3.1 Chronological testing

Bivariate tests for all independent variables are reported in Appendix B. This is because those tests don't show much in terms of association, be it coefficients, p-value or Adjusted R2. Curiously, results start to get interesting when multivariate models are introduced.

Initially I only use the four independent variables I included in my analytical model, in different combinations, on Table 17. Just doing an initial check, it's interesting to see better fit models when they are controlled for all the independent variables. Isolated, they don't seem to apprehend much of the variation on prevention emphasis, but together they are stronger in terms of p-value, magnitude of coefficients and fit statistics (R2 and adjusted R2).

It's counter-intuitive to the usual experience, which is for the fit of a variable to decrease once other covariates are introduced, pulling their share of association with the DV variation. This might be a good reflection of the multidimensionality of the phenomenon I'm studying.

The results become even more remarkable when adding control variables, disposed on Table 18. Fit statistics increase to surprising levels - reaching 0.64, which means 64% of the DV variance can be accounted for in this model. It's extraordinary how the introduction of particular variables alter the logic of previous models which only included the main IVs.

Table 17 – OLS Multivariate Models with Heteroscedasticity-robust standard-errors

Dependent Variable:	emphasis on prevention				
Model:	(1)	(2)	(3)	(4)	(5)
Variables					
Constant	0.0944*	0.1484***	0.7139***	1.354**	1.581***
	(0.0494)	(0.0386)	(0.1489)	(0.5696)	(0.3162)
PolPol	0.0247	0.0429	-0.1958***	-0.3849**	-0.5341***
	(0.0366)	(0.0451)	(0.0712)	(0.1751)	(0.1264)
PolVot	-0.0594	-0.0571	-0.0872	-0.1290	-0.1499
	(0.0592)	(0.0639)	(0.0876)	(0.1028)	(0.0987)
gov_schemes	0.0022*			-0.0032	
	(0.0011)			(0.0031)	
insur_schemes		-0.0006			0.0036**
		(0.0008)			(0.0015)
taxd			-0.5169***	-1.051**	-1.435***
			(0.1390)	(0.4622)	(0.3343)
Fit statistics					
Observations	55	55	45	45	45
R^2	0.12357	0.04317	0.18535	0.21820	0.36700
Adjusted R^2	0.07201	-0.01311	0.12575	0.14002	0.30370

Heteroscedasticity-robust standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

When using clustered standard errors (Table 19), the fit is not as good. Statistical significance is mostly lost or reduced, and errors are slightly greater than the previous model. The fit of the explained variance, represented by the R2, doesn't change though.

Introducing controls (Table 20) has a similar effect to the robust errors models. Control variables have a power to change how the models worked. Although not as good as the robust errors models, clustered errors models have better fit and more significant variables when compared to the ones without the control variables. We should notice that the errors have slightly greater values when clustered than robust-error models.

I refrained from actually discussing the relationships until now so you, while reading, could pay attention to the fact that coefficients and signs don't really change in any of the models I used here, with or without correction for errors with potential heteroscedasticity. Which model is a better fit is hard to say, but they don't seem substantially different, even accounting for difference in errors estimation, which is small.

Keeping this in mind, I'll now use the resulting coefficients to debate my hypotheses.

Table 18 – OLS Multivariate Models + Control Variables with Heteroscedasticity-robust standard-errors

Dependent Variable:	emphasis on prevention					
Model:	(1)	(2)	(3)	(4)	(5)	(6)
Variables						
Constant	1.052***	1.322***	1.027***	0.7055	0.6611	1.727***
	(0.3380)	(0.3830)	(0.2091)	(0.4510)	(0.5923)	(0.3425)
PolPol	-0.3742**	-0.5982***	-0.1762	-0.2221	-0.4532**	-0.1919*
	(0.1806)	(0.1386)	(0.1054)	(0.2159)	(0.1783)	(0.1065)
PolVot	-0.1079	-0.1176	0.1532**	-0.0794	-0.0583	0.2263***
	(0.1083)	(0.0986)	(0.0653)	(0.1084)	(0.0871)	(0.0701)
insur_schemes	0.0021*	0.0030*	0.0045***			
	(0.0011)	(0.0015)	(0.0011)			
taxd	-0.9472***	-1.303***	-0.8209***	-0.5382	-0.6798	-1.078***
	(0.3189)	(0.3538)	(0.2155)	(0.3699)	(0.4519)	(0.2564)
ideologyLeft	0.1084***			0.1246***		
	(0.0316)			(0.0320)		
ideologyRight	0.0479*			0.0410*		
	(0.0251)			(0.0229)		
ratiogdp		0.0251			0.0443**	
		(0.0189)			(0.0213)	
icrg_qog			-0.6821***			-0.9644***
			(0.1393)			(0.1870)
gov_schemes				-0.0012	-0.0007	-0.0106***
				(0.0019)	(0.0030)	(0.0027)
Fit statistics						
Observations	40	45	45	40	45	45
R^2	0.42177	0.39089	0.64020	0.37340	0.28945	0.61570
Adjusted R^2	0.31664	0.31279	0.59407	0.25947	0.19835	0.56644

Heteroscedasticity-robust standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Table 19 – OLS Multivariate Models with clustered standard-errors

Dependent Variable:	emphasis on prevention				
Model:	(1)	(2)	(3)	(4)	(5)
Variables					
Constant	0.0944	0.1484	0.7139	1.354	1.581**
	(0.1078)	(0.1005)	(0.3483)	(1.086)	(0.5530)
PolPol	0.0247	0.0429	-0.1958	-0.3849	-0.5341*
	(0.0771)	(0.1015)	(0.1424)	(0.3122)	(0.2289)
PolVot	-0.0594	-0.0571	-0.0872	-0.1290	-0.1499
	(0.0954)	(0.1008)	(0.1258)	(0.1586)	(0.1502)
gov_schemes	0.0022			-0.0032	
	(0.0027)			(0.0066)	
insur_schemes		-0.0006			0.0036
		(0.0019)			(0.0026)
taxd			-0.5169	-1.051	-1.435*
			(0.3173)	(0.8642)	(0.5862)
Fit statistics					
Observations	55	55	45	45	45
R^2	0.12357	0.04317	0.18535	0.21820	0.36700
Adjusted R^2	0.07201	-0.01311	0.12575	0.14002	0.30370

Clustered (country) standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

H1: Higher levels of Policymaking Stability are associated with more emphasis in prevention policies

My first impression of the two dimensions of the POSTI is the surprising negative sign - but only when controlled for other variables. This means Policymaking Stability has an inverse association to emphasis on prevention under certain conditions.

In most models the Policymaker-Policymaker dimension is more relevant than Policymaker-Voter dimension. Its best performance happens in the model where compulsory insurance is included, where an increase of one point in POSTI makes emphasis on prevention decrease 0.59%.

The most peculiar finding is how the effect of POSTI seems to be conditioned to quality of quality of government. When this variable is introduced, the Policymaker-Policymaker dimension of POSTI loses most of its magnitude of association, while Policymaker-Voter dimension becomes stronger and even significant - this behaviour happens across all models.

Table 20 – OLS Multivariate Models + Control Variables with clustered standard-errors

Dependent Variable:	emphasis on prevention					
Model:	(1)	(2)	(3)	(4)	(5)	(6)
Variables						
Constant	1.052	1.322**	1.027**	0.7055	0.6611	1.727**
	(0.5137)	(0.4711)	(0.3074)	(0.7119)	(0.6199)	(0.5467)
PolPol	-0.3742	-0.5982	-0.1762	-0.2221	-0.4532	-0.1919
	(0.2583)	(0.2986)	(0.1660)	(0.2822)	(0.3596)	(0.1843)
PolVot	-0.1079	-0.1176	0.1532*	-0.0794	-0.0583	0.2263*
	(0.1462)	(0.1590)	(0.0685)	(0.1376)	(0.1405)	(0.0914)
insur_schemes	0.0021	0.0030	0.0045***			
	(0.0017)	(0.0021)	(0.0010)			
taxd	-0.9472	-1.303*	-0.8209*	-0.5382	-0.6798	-1.078*
	(0.5130)	(0.5173)	(0.3427)	(0.5765)	(0.5778)	(0.4512)
ideologyLeft	0.1084**			0.1246**		
	(0.0353)			(0.0411)		
ideologyRight	0.0479*			0.0410**		
	(0.0177)			(0.0136)		
ratiogdp		0.0251			0.0443	
		(0.0278)			(0.0328)	
icrg_qog			-0.6821***			-0.9644***
			(0.1018)			(0.1238)
gov_schemes				-0.0012	-0.0007	-0.0106**
				(0.0037)	(0.0045)	(0.0030)
Fit statistics						
Observations	40	45	45	40	45	45
R^2	0.42177	0.39089	0.64020	0.37340	0.28945	0.61570
Adjusted R^2	0.31664	0.31279	0.59407	0.25947	0.19835	0.56644

Clustered (country) standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Why is the behaviour of POSTI affected by quality of government? And most importantly, why there's a change of importance between the two dimensions?

My theoretical understanding is that quality of government, by the way it's measured, actually captures more of quality of state instead, despite its nomenclature. When talking about factors such as corruption, bureaucracy, and law and order, these are harder things to change. So the stability of policymakers and their incentives won't matter much facing the power of how the state, which implements policies, is configured. Therefore, it becomes a stronger variable.

This also justifies the Policymaker-Voter dimension becoming more important when quality of government is included: this dimension is a relationship up to constant change, regardless of the setting of governmental policymaking arenas.

The negative sign on both dimensions is a trickier affair to understand. It could be due to two explanations: first, in the debate between Stein at al. 2005, from whom I borrow my argument that having more actors creates instability, and Lijphart 2012, that argues in favour of more actors for more stability, Lijphart could be a winner. This means that Lijphart's argument passes the test of meso institutions and meso decisions.

The second possibility can be simply a failure on my part when interpreting the index building. This dimension aggregates variables I expected to have opposite individual relationships to the DV. What does it mean when they have similar enough variance that they could be reduced to a single score? I assumed they were working as compensation, and that an increase would mean more Stability. If this was not the correct interpretation, and, in fact, a numeric increase on this dimension means *less* stability, my expectation is compatible with the results we're seeing, meaning my hypothesis is confirmed.

This suspicion felt stronger after running some robustness tests, using the five individual variables that composed the index instead, in basically all models I tested here. Some of them are reported in Appendix B (Tables 32, 33, 34, 35, 36, 37). Most models weren't well fit, unless a control variable was added. Most importantly, none of the variables that composed Policymaker-Policymaker dimension showed association with emphasis or much responsiveness to the inclusion of other variables in the models, a result I read as validating that the reduced data is a better measure. In a couple models, Policymaker-Voter dimension variables (confidence and volatility) were slightly significant, with a small coefficient.

One interesting thing was the (albeit statistically insignificant) coefficient signs in those models. My hypotheses expected a positive relation between functionality of the committee and confidence, and yet they had negative signs. Number of ministers was assumed to be negative, but it was positive. This is another signal that, perhaps, the dimension I say is measuring stability of the policymaker-policymaker relationship is actually measuring *instability*.

The inevitable downfall of observable measures for social concepts is that we can't really know the mechanism behind them. This is also the reason I'm not talking about causality here.

H2: More fiscal decentralisation is associated with less emphasis in prevention policies

Decentralisation, on the other hand, behaved as expected in my argument, being consistent in significance across models. Higher levels of decentralisation means there's less emphasis on prevention, which I argue is due to the nature of the policy. Prevention requires continuity and overseeing the population as part of a big picture, better coordinated when the fiscal side is centralised.

In terms of magnitude of coefficient, this is the variable with best performance, with coefficients that range between -0.51 (smaller value on a model with only POSTI as covariates), to -1.43 (model with all the IVs, minus controls). At the highest magnitude, an increase in one point of fiscal decentralisation means there's a decrease of 1.4% in emphasis on prevention.

H3:National health systems are associated with more emphasis in prevention.

My initial argument is that of all models, national health systems are more associated with emphasis on prevention, and this variable would be represented by a bigger proportion of government intervention on financing schemes. I decided to test the proportion of compulsory insurance financing schemes in parallel to that, which ended up being a good decision for comparison of results.

The effect of health systems clearly doesn't have the same magnitude as the other variables in my model, nor the same consistency. Both models showed negative and positive signs depending on which covariates were included, and significance also varied greatly.

Considering the most complete models, with all IVs and controls, both models were consistent: government schemes having a negative sign, and social insurance having a positive sign. Both are only significant when quality of government is the control, for robust and clustered errors.

This is telling me that at their peak association, for an increase of a point in proportion of government schemes, the emphasis decreases 0.01%, while a point of social insurance schemes variation means an increase of 0.004% in emphasis.

While it may seem I was once again mistaken, the comparison of both measures still works for my argument, which was that private schemes would be too fragmented to have a big picture of prevention, and they focus on more expensive and lucrative curative care. I used government schemes as the counterpoint, but it actually makes sense for compulsory insurance to have a bigger association following these criteria. When the health system is built on government schemes and public investment, all health expenses are included, and curative care tends

to be overpowering over preventive care. The compulsory insurance system, for how it's more focus designed, would have a better shot at investing in preventive policies.

This discussion should not lose sight of how small the association of this variable is, though.

Control variables

Share of health expenditures on GDP didn't show much result altogether, and considering the empirical literature I was coming from, it was a long shot anyway. This variable keeps not contributing much to the theoretical debate.

Ideology follows the empirical trend of not making much theoretical sense. Center ideology was the category of reference, and moving to both directions, Left and Right, had positive and significant coefficients (0.10 and 0.04, respectively). If both are the same, one can assume ideology doesn't matter when you are aligned with one: going from a centrist cabinet to any side of the spectrum is the only real difference.

Quality of government keeps being an incognito. It's consistently negative, significant, and of substantive magnitude when compared to the other variables (-0.68 and -0.96). One can only assume the reason behind the negative sign: higher quality of government could mean more capacity to implement policies of greater complexity, such as curative care. I won't get much into this discussion, as I haven't delved into the concerning literature. It is of notice, however, the impact this variable has on the others, since it's capable of changing their behaviour when included in the models.

5.3.2 Path dependence

The story I told to get to my theory was that history matters, especially LatAm's history. Briefly reviewing chapter 3, in the 90s there's a series of neoliberal economic reforms following re-democratisation processes. In the 2000s there's a left turn in most of LatAm countries, and the popularisation of conditional cash transfer as redistributive policies, many conditioning the user to mandatory preventive healthcare. Both institutions and policy structure are products of historical trajectories.

While I can't test a whole TSCS, I can still capture a path dependence effect by lagging my independent variables. I'll do it for two moments: 10 and 15 years before the 2010s. Financing schemes data is only available from 2000 forwards, so it won't be lagged for 15 years.

Fiscal decentralisation doesn't go that far behind for most countries, so it won't be lagged at all. I will include the controls quality of government, given its consistency, and ideology, given that there's a bigger cross-section variation of it during the 90s, which could be relevant for results.

Let's compare all three models for the two versions of lagging, regular OLS on Table 21, OLS with robust errors on Table 22, and OLS with clustered errors on Table 23.

Table 21 – OLS lagged models with standard errors (10 years)

Dependent Variable:	emphasis on prevention					
Model:	(1)	(2)	(3)	(4)	(5)	(6)
Variables						
Constant	1.079***	1.013***	1.527***	1.492***	1.738***	2.785***
	(0.1807)	(0.1759)	(0.0966)	(0.3406)	(0.3490)	(0.1549)
lag10_PolPol	-0.2201*	-0.1301	-0.2716***	-0.2163	-0.1398	-0.3493***
	(0.1295)	(0.1312)	(0.0611)	(0.1431)	(0.1425)	(0.0545)
lag10_PolVot	-0.3472***	-0.1749	-0.1752***	-0.3489***	-0.1708	-0.2004***
	(0.0779)	(0.1107)	(0.0402)	(0.0872)	(0.1212)	(0.0351)
lag10_insurscheme	0.0033***	0.0043***	0.0049***			
	(0.0008)	(0.0009)	(0.0004)			
taxd	-0.9044***	-0.7918***	-1.504***	-1.135***	-1.239***	-2.422***
	(0.1852)	(0.1852)	(0.0989)	(0.2996)	(0.2925)	(0.1380)
lag10_qog		-0.3748**			-0.4341**	
		(0.1779)			(0.2132)	
lag10_ideologyLeft			-0.1561***			-0.2076***
			(0.0379)			(0.0336)
lag10_ideologyRight			0.0453			0.0381
			(0.0372)			(0.0323)
lag10_govscheme				-0.0066***	-0.0102***	-0.0141***
				(0.0023)	(0.0028)	(0.0010)
Fit statistics						
Observations	43	43	43	43	43	43
R^2	0.54540	0.59408	0.90887	0.46959	0.52301	0.93164
Adjusted R^2	0.49754	0.53923	0.89369	0.41376	0.45855	0.92024

IID standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

These results are even more astonishing in terms of model fitting. The signs and magnitude are consistent with the previous chronological models. Significance, though, has a peak moment, as it's present in all types of adjusted-errors models.

Before getting into the individual variables, let me call the attention to the fact that the difference between errors is microscopic between the three methods (regular standard errors,

Table 22 – OLS lagged models with Heteroscedasticity-robust standard-errors (10 years)

Dependent Variable:			emphasis on prevention			
Model:	(1)	(2)	(3)	(4)	(5)	(6)
Variables						
Constant	1.079***	1.013***	1.527***	1.492***	1.738***	2.785***
	(0.1731)	(0.1539)	(0.0829)	(0.3095)	(0.3732)	(0.1627)
lag10_PolPol	-0.2201**	-0.1301*	-0.2716***	-0.2163**	-0.1398	-0.3493***
	(0.0973)	(0.0723)	(0.0484)	(0.0932)	(0.0886)	(0.0612)
lag10_PolVot	-0.3472***	-0.1749**	-0.1752***	-0.3489***	-0.1708*	-0.2004***
	(0.0610)	(0.0768)	(0.0378)	(0.0740)	(0.0999)	(0.0330)
lag10_insurscheme	0.0033***	0.0043***	0.0049***			
	(0.0012)	(0.0016)	(0.0005)			
taxd	-0.9044***	-0.7918***	-1.504***	-1.135***	-1.239***	-2.422***
	(0.1805)	(0.1471)	(0.0987)	(0.2544)	(0.2805)	(0.1544)
lag10_qog		-0.3748**			-0.4341**	
		(0.1750)			(0.1839)	
lag10_ideologyLeft			-0.1561***			-0.2076***
			(0.0143)			(0.0134)
lag10_ideologyRight			0.0453***			0.0381***
			(0.0134)			(0.0131)
lag10_govscheme				-0.0066**	-0.0102***	-0.0141***
				(0.0025)	(0.0034)	(0.0010)
Fit statistics						
Observations	43	43	43	43	43	43
R^2	0.54540	0.59408	0.90887	0.46959	0.52301	0.93164
Adjusted R^2	0.49754	0.53923	0.89369	0.41376	0.45855	0.92024

Heteroscedasticity-robust standard-errors in parentheses
Signif. Codes: ***: 0.01, **: 0.05, *: 0.1

heteroscedasticity-robust errors, and clustered errors). I believe this suggests there wasn't as much auto-correlation as I initially assumed, or at the very least it means the findings are reliable.

While the Policymaker-Voter dimension of POSTI had timid contribution in most of the chronological models, save for the one controlled by quality of government, it's clear that when lagged it becomes more powerful in its association power. Quality of government still takes a lot of the effect of both dimensions when it's included, but they stay significant in most models, and still negative. When controlled by cabinet ideology, Policymaker-Policymaker and Policymaker-Voter dimensions reach respectively -0.34 and -0.20 coefficients, while supporting an impressive adjusted R2 of 0.92. This is telling me that when POSTI from the previous

Table 23 – OLS lagged models with clustered standard-errors (10 years)

Dependent Variable:			emphasis on prevention			
Model:	(1)	(2)	(3)	(4)	(5)	(6)
Variables						
Constant	1.079***	1.013***	1.527***	1.492*	1.738*	2.785***
	(0.1874)	(0.1435)	(0.1228)	(0.6278)	(0.6613)	(0.1862)
lag10_PolPol	-0.2201**	-0.1301	-0.2716***	-0.2163*	-0.1398	-0.3493**
	(0.0741)	(0.0718)	(0.0404)	(0.0861)	(0.0740)	(0.1000)
lag10_PolVot	-0.3472**	-0.1749*	-0.1752*	-0.3489**	-0.1708**	-0.2004***
	(0.0895)	(0.0739)	(0.0773)	(0.1253)	(0.0538)	(0.0356)
lag10_insurscheme	0.0033**	0.0043***	0.0049***			
	(0.0012)	(0.0007)	(0.0005)			
taxd	-0.9044***	-0.7918***	-1.504***	-1.135*	-1.239*	-2.422***
	(0.1906)	(0.1559)	(0.1504)	(0.5243)	(0.5272)	(0.1738)
lag10_qog		-0.3748*			-0.4341	
		(0.1624)			(0.2396)	
lag10_ideologyLeft			-0.1561***			-0.2076***
			(0.0261)			(0.0078)
lag10_ideologyRight			0.0453			0.0381*
			(0.0293)			(0.0158)
lag10_govscheme				-0.0066	-0.0102	-0.0141***
				(0.0054)	(0.0060)	(0.0010)
Fit statistics						
Observations	43	43	43	43	43	43
R^2	0.54540	0.59408	0.90887	0.46959	0.52301	0.93164
Adjusted R^2	0.49754	0.53923	0.89369	0.41376	0.45855	0.92024

Clustered (country) standard-errors in parentheses
Signif. Codes: ***: 0.01, **: 0.05, *: 0.1

decade was increasing by one point, it resulted in a decrease of 0.34% and 0.20% of emphasis on prevention in future governments.

Financing schemes remain having lower association when compared to the other variables. Government schemes is a little less consistent in significance across models, while social insurance schemes keeps showing a positive association. In its best performance, also when controlled by cabinet ideology, it shows that one point change in the proportion of this financing model will lift 0.004% of prevention emphasis, while government schemes will decrease emphasis in 0.01%. While the variables representing health systems have limited magnitude, they also have the smallest errors.

Fiscal decentralisation continues to be the star of the show in all models, keeping significance and relative greater coefficient magnitude. In the best fit model, controlled by cabinet ideology, it peaks in size of association: a point more of decentralisation means a decrease of 2.42% of emphasis on prevention 10 years forward.

Quality of government still has the effect of changing the POSTI dimensions behaviour when it's included in the model, although it's subdued when compared to chronological models. Not only its magnitude decreased (to -0.37 and -0.43 coefficients), but also its significance, which even disappears in some models.

Ideology, on the other hand, has a better performance and it sparks more discussion when lagged. Introducing this variable makes all the others do better in model fitting, and makes the adjusted R2 cross the 90% lane of capacity of explanation. Also, there's more difference between having a left or right-wing cabinet. Both are significant, maintaining the idea that it's the alignment that matters, but left-wing cabinets have more magnitude of association, and a newcomer negative sign.

The negative sign of left-wing cabinets is not surprising when we go back to the prevention and welfare state literature. Leftist governments tend to spend more on social policies, while rightist governments use preventive policies as a justification for austerity.

It's important to contextualise the fact that cabinet ideology becomes more relevant to the overall model when lagged, considering that this means I'm talking about the effect of ideology in the 2000s, when there was a left turn in LatAm, on policymaking choices after the 2010s, when the region was going entering economic recession times once again. It's not exactly that the ideology is having a direct effect, but that it was creating a political scenario with policy feedback into the next years - hence why the other variables respond to it being added.

Reaching further back, I want to observe possible path dependence impact from the 90s. Back to before 2000s, the year in which each country starts to have data available varies. So, instead of lagging individually for each country, I delimited a timeframe 15 years, which still captures the same number of observations as the previous lagged model. Still due to data availability, financing schemes are kept lagged at 10 years, and fiscal decentralisation is still not lagged.

Results are reported in Appendix B, Tables 38, 39 and 40.

It seems there's a threshold of how far back we can go and still capture association to current policy choices. Overall, adjusted R2 drastically decreases for all models, peaking at 0.34. The significant independent variables are the first dimension of POSTI, fiscal decentralisation and social insurances schemes, although those associations mostly disappear when I cluster the errors: they stay, even if with higher p-values, when the model is controlled by cabinet ideology.

That one is also the model with better fit, and the one with better estimates from the above mentioned variables. When the POSTI first dimension and decentralisation increase one point each, emphasis on prevention decreases 0.51% and 1%, respectively, while increase on proportion of social insurance schemes makes emphasis increase 0.002%. Proportion of government schemes only has significance in the clustered errors model when controlled by cabinet ideology.

The one consistent point in the 15 years lagged models is cabinet ideology, and this time going on the opposite direction from its future associations. Right-wing cabinets are significant and with greater magnitude than left-wing cabinets, maintaining the positive sign - the movement from being a centrist cabinet to being a rightist cabinet increases emphasis on prevention in 0.1% later on.

We should remember that this was the beginning of the end of the neoliberal reforms period in LatAm. Many cabinets are right-wing, compared to my chronological model, where most of them are left-wing. We know that in a highly unstable political scenario of newborn democracies, the party systems that entered an institutionalisation stage were the ones with any type of alignment, be it left or right.

6. FINDING THE INVISIBLE PROCESSES: CASE STUDY OF FIGHTING DENGUE FEVER PROGRAM IN BRAZIL

6.1 Research design

6.1.1 Method

When deciding to choose policymaking processes, we need to be aware of the implications of adopting one or other unit of analysis. As I discussed in chapter 3, there's a trade-off between granularity and aggregation in general research. This is even more latent in the type of study I'm going for, due to a great part of the processes being invisible to observational studies.

Methods that infer conclusions from quantitative associations can capture from the broadest to the most micro institutions. The ideas and interests, however, which are the other part of this analytical framework (PARKHURST et al., 2021), might get lost even in the best designs. I talk about institutions and policymaking arrangements being products of preference disputes of their origin time, and in a way I use choice in expenditures as a proxy for preferences, but truth is, actors interested in specific policy choices don't fight for expenditures, but for their content and how they'll be designed (ESPING-ANDERSEN, 1991).

Trying to remedy this aspect, I opt for conducting a preventive policy case study. This method is chosen when the research wants to answer questions of "what", "how", and "why" while incorporating the complexity of the phenomenon. When compared to other qualitative techniques, the case study is supposed to be more flexible, particularistic to the phenomenon/event/program, descriptive, and heuristic (EBNEYAMINI; MOGHADAM, 2018).

Similar works have been conducted in other countries. Trying to find consequences of changes in institutions on policymaking processes, a case study about health in Chile has found that institutional reforms weren't able to change elitism and high technocratic influence in Chile. In this study, it is shown that the stress between preventive and curative emphasis exists since the beginning of the twentieth century in Chile, with wins and losses from both sides (OLAVARRIA-GAMBI, 2021).

Changing continents, another case study investigates the forces that drive malaria control decision-making at the national level in seven African countries. It also explores how various arrangements of stakeholders and financing shape strategic and programmatic decision-making, beyond the policy and planning approaches of technical evidence review alone. It finds that, even under prevalent technical interventions, the dependence on funding from donors and international institutions makes the policy susceptible to the interests of these agencies (PARKHURST et al., 2021).

What those have in common with my own work is the same argument: even in health, there are political forces guiding policy choices. Institutions, ideas and interests are crucial variables that can be examined through a case study.

Since I have a previous research question, and I'm using a case study to supply a need for general understanding of the theoretical puzzle, giving me insights for that problem, I can classify this as an instrumental case study. I'm not looking for an inductive method in which I'll develop theory based on the practice of the study through my direct interpretation - I already have have a theory, and it'll be used to identify repetition of phenomena, to improve my theoretical assumptions, and build arguments not previously considered. This means the data I collect will be analysed via categorical aggregation (STAKE, 1995).

I use multiple sources to collect data for this case study: documents, including historical records, and elite interviews with key bureaucrats involved with the Brazilian Dengue Fever Control Program.

Should be of notice that elite interviews, considered one of the most important tools in political science and policy studies, are their own object of discussion. Some claim there could be an imbalance of power coming from elite interviewees; others argue the opposite, in which the interviewees are vulnerable due to the fear of exposition or adequacy of their knowledge. In authoritarian settings, elites may try to control the researcher's agenda, or they might be hesitant and unsafe in sharing policy opinions (MBOHOU; TOMKINSON, 2022).

I'm using the same interview guide as Parkhurst et al 2021, adapting to my policy of choice (Dengue Fever Control, while the original work studied Malaria Control). It's available on Appendix C.

Table 24 summarises my research design for the case study, based on the framework categories described in Ebneyamini & Moghadam 2018.

Table 24 – Research Design - Case Study

Research topic	Emphasis in prevention policymaking
Research question	What are the driving forces behind the continuity of the Dengue Fever Control Program in Brazil?
Purpose of case study research (CSR)	Theory-oriented
Reason to use CSR	Theory refinement/ Hypothesis building
Type of CSR	Instrumental
Methods of gathering data	Archival records Document review Semistructured elite interview
Data analysis	Categorical aggregation

Source: Author's elaboration (2023)

6.1.2 Choosing the case - Dengue fever in the Americas

I had the task of choosing one preventive policy to study, and it ended up being Dengue Fever Control, a primary type of preventive intervention - targets the whole population by modifying social or physical environment (CAIRNEY; DENNY, 2020). This is a good case because it has the potential of helping me understand a bigger picture in Latin America.

Among relevant infectious diseases, dengue fever is the most reported mosquito-based disease in the Americas. Between 1940 and 1970 government campaigns in multiple Latin America countries succeeded in eradicating dengue fever due to control of the mosquito in the larval stage. However, these campaigns were discontinued in a shift of priorities, and mistakenly considered a problem solved, which led to large re-infestation in the 1980's. Subsequent dengue fever epidemics didn't follow international organisations prevention protocols, adopting instead inefficient strategies to kill adult mosquitoes, a decision that brought back uncontrollable outbreaks and numerous deaths (GUBLER, 2005).

The vector for the dengue fever is the *Aedes Aegypti* mosquito, also responsible for transmitting multiple diseases - called arboviruses, like Yellow Fever, Chikungunya Fever, West

Nilo and Zika. For these four diseases alone, there were globally 380 epidemic events between 2011 and 2017 (Organisation mondiale de la santé, 2018).

If before these diseases were geographically restricted to the tropics, in the last years they spread through North America, like most epidemics in the 21st century, with wider and quicker reach (MATTHEWS; HERRICKS, 2015; Organisation mondiale de la santé, 2018). Infections brought by travellers and climatic changes are some responsible factors in this. Vaccines are developed for almost none of them, considering the nature of this type of virus. Prevention measures are the only available tactics to be adopted to mitigate the mosquito and protect vulnerable parts of the population (MATTHEWS; HERRICKS, 2015).

All vector diseases interventions are based on vector control and supportive care only, with the exception of Yellow Fever, for which there is a vaccine. Due to climate change, rampant informal urbanisation, and intensified population movements, the risk of urban outbreaks with international spread of arboviruses are increasing (Organisation mondiale de la santé, 2018).

Between 2011 and 2015 there was an increase of 58% in reported dengue cases compared to 2006-2010: a cumulative total of over 8 million just in the Americas, although it's suspected excessive reporting happened in the 2015 outbreak due to two new arboviruses by then: chikungunya and zika, with clinical manifestations similar to dengue (PAHO, 2017). In 2018, 16 countries and territories in the Americas experienced an increase in cases when compared to 2017, but in a lower number than the historical average in the previous 11 years (PAHO, 2019).

In the Americas, Dengue Fever transmission is mostly cyclical, every 3 to 5 years, but in Brazil there's a continuity of transmission since 1996, where there are periods of epidemics and periods of introduction of new serotypes[1] of the virus (ARAúJO, 2018).

Specifically in Brazil, from the nineties to current days, a total of five major mosquito/dengue federal prevention programs were established, with no particular break in the proliferation of the *Aedes Aegypt* and transmission levels ever since. These programs are not continuous, and data shows that the mosquito has been able to complete its cycle of life, which implies that something is failing in these programs (ARAúJO, 2018). The idea with the case study is to identify the processes behind these decisions.

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[1] A serotype is a group within a single species of microorganisms where its individuals share some structural traits that make it distinct from other groups. In this case I'm talking specifically about Dengue Fever virus serotypes. There are four documented: DENV 1, DENV 2, DENV 3 and DENV 4, and in some countries more than one type circulate simultaneously in the past 20 years, which increases the risk of outbreak (PAHO, 2019).

Table 25 – Summary of Interview Respondents

Role	Years working in the Dengue Program	Placement
Health Analyst	4+	State: Pernambuco
Institutional support	20+	State: Pernambuco
Technical Support in Endemics systems	20+	State: Pernambuco
Health Analyst	9+	State: Pernambuco
Coordinator of Environmental Surveillance	20+	Municipality: Recife

Source: Author's elaboration (2023)

All countries which report dengue fever cases in the Americas have some sort of dengue control policy in place (PAHO, 2017). Even if I'm only working with Brazil, due to easier accessibility of data, I assume my findings can be useful to the general understanding of LatAm.

For document review, I selected 40 policy documents that date between 1975 and 2022. I've included legislation (decrees, laws and ordinances), national and local guidelines, and technical manuals. The list can be found on Table 41, at Appendix D.

My elite interviews comprised of agents at municipal and state level directly involved with the Dengue Control Program, conditioned to their availability. Choosing a qualitative sample followed the simple criterion of participants who can best help me understand the phenomenon I'm exploring (CRESWELL, 2015). The profile is mainly bureaucrats, since in general they have the benefit of being permanent, hence retaining knowledge of previous scenarios before a change is made in the policy.

Federal level actors weren't accessible while preparing for the field research. Selection was therefore both intentional and by convenience, as I looked for available respondents in the theoretical profile more interesting for my research (ROCHA, 2021). Respondents are summarised on Table 25.

I oversaw both individual and group interviews, conditioned at the availability of respondents. Both types work for the type of research and respondent profile I was going for: there was no interest in personal experiences, but of those related to a common interest, such as a policy. There was no difference between interviewees that would make them hesitant to speak, as they all shared the same work activities (GASKELL, 2002).

Saturation is a criterion used in qualitative research to determine sample of interviews - if there's nothing else to learn, the sample is enough. It's generally recommended that the num-

ber is justified based on the complexity and extension of the research object (ROCHA, 2021). However, lack of transparency of what constituted the definition of saturation is a generalised problem in qualitative research, and many end up using positivist justifications (or apologies) regarding a big or small number of interviews, which is not adequate for this type of research (HENNINK; KAISER, 2022).

Using interviews only, I can say that saturation wasn't reached and couldn't be pursued for logistical reasons. The experience of smaller municipalities and national actors would bring valuable insights. I attempt to fill this gap with the document analysis, especially for the national side, which was the main reference for my theoretical argument and quantitative analysis. I understand the limitations of my sampled data, restricting the type of conclusions I can take for the non-documented policymaking process, but I still gather enough understanding about the policy trajectory.

I conducted the codification of all material (interviews and documents) following the same theoretical categories I've been arguing for since the beginning, representing the driving forces of the emphasis in prevention.

So I looked for how prevention was conceptualised in the context of the policy; what was known about the disease and epidemiological status of the country; the separation of responsibilities considering decentralisation and health system structures, and how integration of areas and spheres works; the implementation of the policy, through the lenses of financing, health surveillance, preparedness, and flux of information; which ideas, preferences and evidence are used for decision-making; and finally any aspect related to long-term policymaking and policy feedback through learning.

Coding can be a subjective process, even if theoretical categories are already established. Many themes end up getting mixed, since reality isn't perfectly separated in neat topic boxes. While it wasn't flawlessly operated (could have been coded a little differently if a pre-test was made), having the theory as a reference helped to overcome difficulties in coding. Triangulating content from interviews and documents also validated my impressions when aggregating topics for discussion.

The summary of references and coding categories can be consulted on **??, ??**.

6.1.3 Ethics statement

This project has documented formal authorisation of execution in the municipal and state level health departments, and approval from the IRB from the Universidade Federal de Pernambuco. The respondents signed a Term of Consent, and have guaranteed anonymity.

6.2 Findings

6.2.1 The weakest link: Knowing the enemy

In any health surveillance guideline you will find the blunt verdict: *Aedes Aegypti* (Figure 12) is the weak link in the task of preventing arboviruses, in these words. Vector-control is such a straightforward effort that it had been done by accident before. In 1691, when the city of Recife was some years into the first documented yellow fever epidemic in Brazil, the governor of Pernambuco got infected and triggered the also first ever official sanitary campaign in the country, which managed to stop dissemination of the disease for another hundred years.

Except that the connection of mosquitoes and disease transmission was only made two hundred years later, by Cuban doctor Carlos Finlay. Cleaning the streets and disposing of trash were some of the effective sanitary measures taken, not knowing they were actually impeding proliferation of the insect (CAFé-MENDES, 2017).

Figure 12 – The enemy: *Aedes Aegypti*
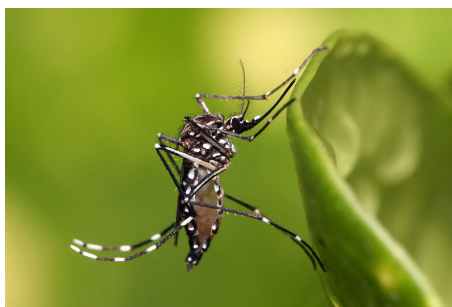
Source: Muhammad Mahdi Karim

It's impossible to search for the driving forces behind dengue control policy without talking about Yellow Fever. Dengue Fever is just a (literal) natural continuation of Yellow Fever, and it will probably be followed by Zika and Chikungunya or other vector-transmitted diseases to come. The enemy is the same, and it's not going away.

Exposing the whole policymaking trajectory of Yellow Fever would require another thesis [2], so I'll just summarise the main aspects - they're important, as the Dengue Fever Program is a product of those policy choices.

The campaigns that targeted the *Aedes Aegypti* as the vector of Yellow Fever started in 1901 in Sorocaba, São Paulo. In 1903, at the city of Rio de Janeiro, the Yellow Fever Prophylaxis Service was led by Oswaldo Cruz using a very familiar format: he divided the city in "sanitary districts", and equipped each district team with maps and epidemiological statistics so they could track larvae infested water deposits and make traps for adult mosquitoes (BENCHIMOL, 2001). This model is used to this day in Brazilian municipalities.

For essentially the next century, the main goal was to eradicate the mosquito. There wasn't a consensus on how to do that, though. Ideological divergences between policymakers, the medical class, the population and international agencies represented an obstacle during many points along the history of the battle against Yellow Fever. Eradication did happen multiple times: but reinfestation would hit again and again, and the gap between epidemic outbreaks was becoming shorter.

It wasn't a continuous policy exactly because it focused on eradication. As soon as a non-epidemic phase was reached, Yellow Fever ceased to be a priority. The actions were short, intensive, and laser-focused, which means preparedness was never built for the future. It's the paradox of control: once a problem is under control, measures are relaxed, and it goes back to being an active issue (WIERING; IMMINK, 2006). With the introduction of the vaccine, and the last documented urban case happening in 1942 (status broken in 2017, when urban yellow fever came back to charts), immunisation became the number one priority (and it wasn't an easy one to implement at the time), while wild yellow fever was kept under control.

Except that, while urban yellow fever wasn't circulating anymore, the *Aedes Aegypti* had a revolving presence in the country. The valid fear of the disease being imported through the arrival of ships, after it happened during previous non-epidemic times, can be found on decrees from the 60s, where surveillance of foreign arrivals was heavily emphasised and regulated. Guidelines for *Aedes Aegypti* eradication from 1978, when another reinfestation devastated the country, were still about urban yellow fever.

At the time, the Health Ministry adopted the short and intense eradication approach once again, promising it would take two years (Figure 13).

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2   I recommend reading *Febre amarela, a doença e a vacina, uma história inacabada* 2001 for a comprehensive walk through this topic.

Figure 13 – Excerpt from Brazilian newspaper from 1980 with the news about the Eradication
Program of 1980

Ministro da Saúde teme conseqüências do surto de febre amarela silvestre

Brasília — O Ministro da Saúde, Sr Waldir Arcoverde, disse ontem que a reinfestação causada pelo mosquito transmissor da febre amarela silvestre em Goiás poderá criar uma imagem negativa no exterior e trazer graves consequências econômicas para o país, com fechamento de portos e aeroportos internacionais.

Afirmou, em seguida, que não existe no país focos de febre amarela urbana, e sim silvestre. O Sr Arcoverde anunciou ontem um programa de dois anos para erradicação dos focos de febre amarela silvestre.

MAIOR ÁREA

Explicou o Ministro que o Brasil é o país que possui a maior área de febre amarela endêmica do continente, devido à grande extensão de suas florestas.

Para o Ministro, os casos de febre amarela constatados em Goiás não chegam a constituir um surto epidêmico. Foram apenas oito casos — disse — embora sete tenham sido fatais. Acrescentou que a comissão técnica nomeada pelo Ministério da Saúde para executar o programa de combate à febre amarela já sugeriu uma série de procedimentos para erradicação do mosquito aedes egypti, transmissor da febre amarela urbana, que atualmente está se proliferando na Bahia, no Rio de Janeiro e no Rio Grande do Norte.

A comissão propôs que seja executada uma política rígida e inflexível de combate à doença, com ampla divulgação dos meios de extinção dos focos pelos serviços permanentes de saúde e pelos órgãos de comunicação. Propôs ainda o aumento da produção de vacinas e dos postos de vacinação.

Source: Acervo Jornal do Brasil (07/03/1980)

What was also happening at the time was the introduction of Dengue Fever, which would only start to be mentioned in the government's epidemiological guidelines from 1985 forwards, after its first clinically and laboratory documented epidemic in 1981-82. During the 80s, Dengue Fever was very associated to Yellow Fever in official documentation, and protocols for urban vector-control were just passed over from one to the other.

This meant that the historical strategy of periodical eradication strategies is maintained. In 1985 the four serotypes of Dengue (DENV) were already known, and the disease was included in the list for compulsory notification and entomological/environmental surveillance for viral circulation. The goals for prevention were essentially transferred from the Yellow Fever

Figure 14 – Historical images of Aedes Control Campaigns

Aspecto do tratamento perifocal

(a) Guard applying product in breeding site

PULVERIZADORES DE INSETICIDAS PELO MÉTODO ULTRA-BAIXO-VOLUME

M.S. SUCAM

Máquina Leco instalada sobre veículo

(b) Campaign car for insecticide spraying

Source: Combate ao Aedes Aegypti - Instruções para guardas, guardas-chefes e inspetores (1985)

experience before vaccination: reduction of vector density and health education, helped by the participation of the community.

Epidemic outbreaks occurred one serotype at time, but the dynamic quickly changes in the 90s to 2000s, when they start to circulate simultaneously, which characterises hyperendemicity. Between 2013 and 2015, two new *Aedes Aegypti*-transmitted diseases are added to the equation: Chikungunya Fever and Zika Virus.

The state of Pernambuco is particularly affected: Recife has its first notified cases in 1995, with epidemic outbreaks arising in the years of 2002, 2007, 2010, 2011 and 2012 (in 2011 it went from re-emergent to endemic disease) - in 2015 it became the epicentre of Zika Virus epidemic event. The concurrent circulation of the four DENV serotypes, combined with socio-environmental vulnerability of the population, proliferation of the mosquito, and deficit in response capacity from health services creates a Public Health Urgency situation in the state.

Pernambuco's State Health Plans are explicit about the state's susceptibility to it, since the environmental conditions are considered favourable to mosquito proliferation, in addition

to a sanitation deficit, and lack of investment in rural areas. Those plans introduce as goals the reduction of lethality rates and expansion of promotion actions.

The battle against the vector is becoming unified, and a name change for the national program is in the works to reflect that (it will eventually become Arboviruses Program, according to the interviewees). Dengue Fever is currently considered the most important arbovirus in the world, and one of the biggest public health concerns.

Let's try to understand the factors building up the policy in the next sections.

6.2.2 There's no belief in science, but there is in politics

> I think basically because of this that the expertise, the technique, the science of the thing: our team, and the regional centre team, and even many municipalities teams, they all have it. It's nothing like "oh we don't know what to do". (Interviewee A, own translation)

It may seem easy, to have a simple technical direction: destroy vector at larval phase, control adult phase. The general consensus amongst interviewees is that they know what to do, but there are obstacles beyond their control. By knowing what to do, they mean they follow the norms. My point is: to even get to the norms, there are a series of political decisions which may not be visible from a technical point of view. Which products to use? Where intervention is needed? How is implementation designed? What are the priorities, and why?

Some of the political evidence orienting decisions for the Dengue Program are the actual concept of prevention, how health surveillance is organised, responsibility from different federal units, financing capacity, the intention of short or long term policy, and the memory from previous experiences.

The concept of prevention is important because it's the starting point for any decision-making: it defines where do you want to go, so policymakers can design how they'll get there. Guidelines from 1986, when urban yellow fever was still the main focus, introduced prevention as a combined effort between vaccination coverage and investigation mechanisms for detection of new cases and evaluation of the extension of the problem.

The plan for *Aedes Aegypti* eradication in 1996 (PEAa) shows a shift of focus to Dengue, and more importantly, acknowledges that what has been done up until then wasn't enough. Prevention for the new Dengue infestation scenario that had started to reach Brazil in its totality expresses that what should be eliminated are the *obstacles* to mosquito eradication. There's a big focus on integration, be it of different spheres of management, of political and social forces,

or of action approaches. This is recognised by the 2002 national reformulation (PNCD), yet, it also raises how, even after bringing more resources for the actions against the vector, the PEAa was still limited, not attending to the epidemiological complexity of Dengue. For example, the focus was almost entirely in using insecticides.

PNCD represents the biggest shift of the concept of prevention: after a hundred years working back and forth to eradicate the mosquito, it's admitted that due to changing urban conditions, it became impossible for this to be true. *Aedes Aegypti* won't go away, so prevention needs to work with vector control instead. This is reiterated in 2014, when a contingency plan for Chikungunya fever needs to be put in place, following Brazil's first epidemic outbreak of this disease.

Changes still keep happening. Making the population aware on how to prevent mosquito breeding sites to grow has been a big part of prevention policy for arboviruses. PNCD defines social communication's goal to publicise and inform about the government's actions. 2009's epidemiological surveillance guide makes an important differentiation between communication and education of health - it says the population needs also to be educated, and endemic reports should have accessible language to help with that. Social mobilisation is described here as a support to the policy actions. Surveillance's role is to reduce the force of transmission and strengthen the articulation and completeness of preventive actions.

An important ordinance also from 2009 (No. 3252) gives support to this articulation by incorporating the Endemic Control Agents (ACE) to the teams of Family Health - meaning the implementation of preventive policies is part of the primary healthcare structure.

The role of communication as a preventive measure keeps developing, as in 2013 it's recommended that it should incorporate regional specificities. A good example of this is the ad from Recife's Prefecture from 2021 in Figure 15. From communication as information, the 2018 Law (No.13595) says the promotion of health must be a dialogue with the population, combining scientific knowledge and popular wisdom.

Figure 15 – Still picture of Ad from Recife's Prefecture for the Dengue Control Program in 2021

Source: Prefeitura do Recife

Epidemiological surveillance is a direct product of how prevention is being conceptualised. As we've seen, there are no drastic changes in the concept, and surveillance follows suit, by having incremental developments to how it's organised. The technical manual from 1985 is already a long-term construction with cumulative updates from the 1940s. The PEAa mentions the generation of institutional memory: and this is important considering that, despite having technical reference, the policy is not continuous at this point.

The PNCD was the concept biggest adjustment for the Dengue policy, when it stops being a plan and it becomes a program. Starting from 2001, guides don't just bring revisions anymore, but also changes in shape, model and technology for control.

> (since 2002) I don't see much difference from the way we work today. We add new activities, new technologies, new inputs, new equipment. New forms of control are being used, but the methodology of analysis and the indicators are all the same. (Interviewee B, own translation)

The accumulated experience is recalled as positive when facing unusual epidemic events in the 2009 guide.

Going digital is mentioned by all bureaucrats: in before times, paper processes dominated, making data go through many hands before getting to the actual policymakers, and with automation of systems, the trajectory of info from municipalities is shorter and quicker.

> For me, after the implementation of the program, we start to look differently at surveillance, all the health conditions there, the risks we found (...). We started to have a big picture view of what's happening with that family, that home, that residence. I think this made the thing evolve a lot, to go beyond the main issue, to have our mental view of it, isn't it? It's a social issue, isn't it? (Interviewee C, own translation)

This interesting point from an interviewee is coherent with the decision of unifying guides in 2014: epidemiological guidelines are now included in a tome called Health Surveillance Guide, building from the historical construction of the guides. From then on, the new editions go back to the format of revisions when necessary, as seen in the 2022 contingency plan for urban cycle arboviruses: it explicitly incorporates experiences and historical learning as a reference for structuring strategical actions.

Once a surveillance model is set, we can estimate how much it will cost. Financing is perhaps the epitome political decision - so exemplary of preferences that it was my quantitative proxy for emphasis in prevention (chapter 5).

The cost of financing a policy was behind most of the debate on whether vector-control should be a short or long-term policy. In 1982, two years after promising to eradicate the *Aedes Aegypti*, the ministry of Health says the government doesn't have the funds to sustain a permanent campaign (BENCHIMOL, 2001).

The concern about continuity and reformulation of the policy seems to be blossoming around this time, as the 1986 guide expresses the necessity of a good quality information feedback system for it to be possible. When Brazilian's national health system (SUS) is created, through the Law No. 8080, one of the criteria for social security funds transfer is the epidemiological profile of the population to be covered by those funds.

PEAa is mainly justified through the argument of costs. Dengue epidemics are expensive in two fronts, it says: for insecticide use, and the increased need for hospital treatment when hemorrhagic dengue is developed. The central proposal of PEAa is that the cost of eradication is smaller than control actions - in the long term. It expresses how many resources were wasted in old strategies that didn't work, and with the approval from technicians from PAHO, Brazil could implement the eradication plan.

With the failure of the PEAa and restructuring of the plan as a permanent and universal Program in 2002 with the PNCD, results and answers are now expected to happen at mid and long-term, in integration. An example of how resources were distributed can be found in Appendix A. In 2005, a financial ceiling for states and municipalities is implemented, considering epidemiological differences, territorial extent of the municipality, and an extra is added in case the municipality is responsible for managing its own surveillance and control actions.

The effect of these changes are felt in the reduction of Dengue cases by 2009, when another step into integration is taken: considering the multi-sector complexity of the fight against

Dengue, financing should reflect that, by coming from different sources of the three government spheres. The financial ceiling is altered for 642 priority municipalities, as well as the acquisition of equipment and inputs. Besides, this is when Dengue Prevention is included in Primary Health, the implication being the use of fixed and variable resources from the Financial Floor for this area in actions against Dengue - even if local managers affirm this sector is still underfunded.

A bigger flow of resources means more criteria are put in place to better coordinate them. The ordinance No. 3252 from 2009 conditions transfer of funds to feeding the information system. In 2010, the financial resources for all types of surveillance (sanitary, epidemiological, environmental, etc.) and promotion of health are included in the big group of Health Surveillance. The catch is that there are two types of resource, the Structuring Floor, based on cost per *capita*, and the Strategic Floor, which is dependent on negotiation in a committee of managers. The decree No. 7508 from 2011 regulates that, conditioning the transfers of resources between federal entities to the Health Region delimitation.

> Financing is "sanguineous", as we call it, it flows from the Ministry to the rest, as well as human resources. This doesn't impede (the municipality) of also using state resources. What we do is, for the municipal action, we already have the financing and they execute, it's a routine of activities, and they also execute emergency actions. (Interviewee B, own translation)

A series of decisions strengthened this format mentioned by the interviewee. An optional financial incentive for the municipalities is offered to make ACEs part of primary health teams through Ordinance No. 1378 in 2013, and specifies that health surveillance resources can't be used to buy inputs already provided by the Health Ministry.

> The Ministério Público (legal controlling body in Brazil) can question us, "why are you buying a product that is free?" This about the control of the control resources. Are you spending for other purposes? (Interviewee B, own translation)

The decree No. 8474 gives national assistance to the municipalities so the minimum wage for ACEs are followed. It establishes a minimum of one ACE per municipality, and estimates the maximum amount they can employ.

In 2015, an emergency action is need, for the newly founded triad of arboviruses epidemic: Dengue, Zika and Chikungunya. Federal government allocated around US$ 200 million for epidemic response measures (PAHO, 2017). International bodies were also investing at

the time, but alerted that measures against adult mosquitoes were "good for pictures", but of debatable efficacy (Figure 17).

Figure 16 – Newspaper page about measures taken for the Zika Virus Epidemic of 2016

Metrópole

Saúde. Brasil deve acelerar a adoção de teste único para zika, dengue e chikungunya no Sistema Único de Saúde; ministro voltou a defender ligação entre vírus e microcefalia, enquanto Opas prevê necessidade de multiplicar por dez gastos contra o 'Aedes aegypti'

Países latino-americanos vão combater zika e comprar remédios em conjunto

Rodrigo Cavalheiro
ENVIADO ESPECIAL / MONTEVIDÉU

Uma reunião de emergência entre 12 ministros latino-americanos para tratar do combate unificado ao zika vírus terminou com a aprovação de 16 medidas ou orientações ontem na sede do Mercosul, em Montevidéu. O documento propõe "buscar mais recursos", "trocar experiências sobre bebês com microcefalia" e "negociar compras conjuntas de medicamentos de alto custo".

Os pontos mais concretos foram a criação da comissão para monitorar os casos de zika e a distribuição de informação sobre a doença em portos, aeroportos e postos de fronteira. No ponto da aquisição em lote de medicamentos, o texto cita os indicados para a Síndrome de Guillain-Barré, relacionada pelo Brasil à propagação do zika.

O ministro da Saúde do Brasil, Marcelo Castro, afirmou ainda que o País terá em um mês, nos postos do Sistema Único de Saúde (SUS), o teste que detectará se um paciente febril picado pelo mosquito *Aedes aegypti* tem zika, dengue ou chikungunya. O teste havia sido anunciado em 15 de janeiro, mas a previsão era de que estaria disponível só no meio do ano.

Atualmente, são necessários testes separados e uma das maiores dificuldades no diagnóstico do zika é que três em cada quatro pacientes não procuram o médico por terem sintomas muito leves. Também por isso, a projeção de infectados feita pelo Ministério da Saúde varia de 500 mil a 1,5 milhão. "Se a pessoa tiver infecção, virose, dor de cabeça ou dor no corpo, irá ao médico, retirará o san-

ANDRES STAPFF/REUTERS

Coordenação. Castro, entre colegas do Uruguai (à esq.) e da Argentina, negou com ênfase aborto em casos de microcefalia

gue em duas ou três horas e sairá o resultado dizendo se tem uma das três doenças. O teste já foi desenvolvido, está sendo produzido e será distribuído no fim do mês". Ele ressaltou que o exame interessará mais às gestantes, em razão da ligação feita pelo Brasil entre o vírus e bebês com microcefalia.

Essa relação fez o brasileiro ser o mais procurado por dezenas de jornalistas de todo o continente após a divulgação da declaração conjunta. Castro era questionado sobre as provas dessa conexão. Há 4.700 suspeitas e 407 confirmações de microcefalia no Brasil. "Temos certeza absoluta, inequívoca, dessa relação. Antes tínhamos 150 casos em um ano e em alguns meses fomos a milhares", sus-

tentou. Entre os argumentos que expôs, o primeiro é a coincidência geográfica entre a área mais atingida pelo zika, o Nordeste, com 86% dos casos, e o maior número de crianças atingidas. E citou três testes ligados a bebês com subdesenvolvimento craniano. Um encontrou o vírus em um feto, outro em uma criança morta em um aborto natural e um terceiro na placenta após um parto.

Pressionada a opinar sobre a convicção brasileira, a diretora da Organização Pan-Americana de Saúde (Opas), Carissa Etienne, disse que as grávidas devem ter cuidados especiais, mas lembrou que os únicos relatos de microcefalia associada ao vírus estão no Brasil. Ela afirmou ainda que a entidade preci-

sa multiplicar por dez seu investimento no combate ao zika vírus no continente e chegar a US$ 8,5 milhões e alertou que a fumigação é eficaz apenas contra o mosquito adulto. "É ótimo para fotos, mas o efeito prático é muito discutível".

O tempo comprovará (*a ligação entre zika e microcefalia*) ou não", disse o ministro Alejandro Gaviria Uribe, da Colômbia – onde o governo estima que haja 20 mil infectados por zika.

Ele defendeu que uma gestante tem direito a abortar, em decisão conjunta com médico, se enxergar na gravidez de uma criança com microcefalia um risco para sua saúde mental. Questionado sobre a possibilidade de flexibilização do aborto, o ministro brasileiro foi enfático: "Não, a lei brasileira proíbe."

Expansão. Ontem, a Organização Mundial da Saúde (OMS) indicou que 32 países e territórios têm casos autóctones de zika vírus. Desses, 26 estão nas Américas, além de Cabo Verde, Maldivas, Fiji, Samoa, Ilhas Salomão e Vanuatu. A OMS também sugeriu que a Europa começasse a se preparar para o surgimento de casos locais a partir de abril.

NA WEB
Portal. Tire suas dúvidas sobre o zika vírus
estadao.com.br/e/tudosobrezika

Marcelo Castro
Ministro da Saúde do Brasil

1. O Brasil já está conseguindo ganhar a batalha contra o mosquito? O que eu venho dizendo é: 'Agora, o mosquito não vai me ganhar.'

2. Mas isso é uma vontade ou um fato? A sociedade, com o governo, está fazendo o esforço máximo necessário. Vamos ganhar porque não podemos perder.

3. Mas qual investimento está sendo feito para mudar a situação, que o senhor mesmo diz quem vem há 30 anos? Nunca houve uma mobilização do governo federal como agora. Temos 46 mil agentes de combate às endemias no Brasil. Além disso, nós colocamos mais 266 mil agentes comunitários de saúde e as Forças Armadas. E os governadores colocaram as Polícias Militares, os bombeiros. Os 5.570 conselhos municipais de saúde estão mobilizados e todos os prefeitos. Montamos uma sala de controle nacional. Tudo isso, mais a participação da sociedade.

4. Com essa estrutura toda, quando o senhor acha que vai controlar a epidemia? Nós seremos vitoriosos. Primeiro, nós já fomos vitoriosos no passado (*nos anos 1950*). Segundo, temos dezenas, inúmeros exemplos de cidades que resolveram eliminar o mosquito e conseguiram. / R.C.

Dilma convoca 'guerra' e sofre novo panelaço

Em uma tentativa de evitar a ira da população e panelaços que foram programados pelo País afora, a presidente Dilma Rousseff começou seu pronunciamento de seis minutos em cadeia de rádio e TV para falar da transmissão de doenças pelo *Aedes aegypti* pedindo "licença" pa-

ra entrar na casa de todos. "Não vou falar sobre política ou sobre economia. Vou falar sobre saúde, que é urgente e que temos de travar neste momento em defesa das nossas famílias. Uma luta que deve unir todos nós", disse a presidente. "Vamos provar, mais uma vez,

que o Brasil é forte, tem um povo consciente, e não será derrotado por um mosquito e pelo vírus que ele carrega", emendou.

Apesar disso, foram registrados panelaços em Higienópolis, Santa Cecília, Consolação, no centro, em Pinheiros, Alto da Lapa e Vila Romana, na zona oeste, e no Jardim Marajoara, na zona sul de São Paulo. Em alguns bairros, foi registrado também buzinaço. Depois da crítica interna ao ministro da Saúde por ter falado que o Bra-

sil estava perdendo a guerra contra o mosquito, Dilma voltou a usar o termo pronunciamento e disse que "não podemos admitir a derrota porque a vitória depende da nossa determinação em eliminar os criadouros", afirmou.

Sem detalhar o montante investido pelo governo, a presidente afirmou que todos os recursos "financeiros, tecnológicos e humanos necessários" serão colocados "nesta luta em defesa da vida". Ela frisou a operação que será realizada no dia 13, envolvendo 220 mil homens e mulheres das Forças Armadas. "Vamos nos espalhar por todo território nacional e, juntamente com os agentes de endemia e de saúde, com você, vamos visitar o máximo possível de casas, para destruir os criadouros do mosquito", afirmou.

Criticada ontem em sua fala contra a abertura do Ano Legislativo pela deputada Mara Gabrilli (PSDB-SP) por não ter ações efetivas para cuidar das crian-

ças com microcefalia, Dilma disse que queria transmitir "uma palavra especial de conforto às mulheres brasileiras, principalmente às mães e às futuras mamães". Pela manhã, já havia ressaltado o trabalho feito até agora. "Nesse ponto, nós estamos muito avançados. Descobrimos a doença em outubro e, em um mês, constatamos que (*a microcefalia*) era por causa do mosquito e começamos a agir", justificou. / TÂNIA MONTEIRO, CARLA ARAÚJO e DANIEL GALVÃO

Brasil analisará uso de radiação contra 'Aedes'

Projeto de esterilização da agência atômica será discutido em Brasília, mas funcionaria melhor em pequenas cidades

Jamil Chade
CORRESPONDENTE / GENEBRA

Na esperança de reduzir de forma substancial o vetor do zika vírus até os Jogos Olímpicos, o Brasil vai avaliar o uso de radiação nuclear para combater o mosquito *Aedes aegypti*. Um encontro será feito entre o Ministério da Saúde e a Agência Internacional de Energia Atômica (AIEA) nos dias 17 e 18, em Brasília, com a meta de avaliar a implementação de um amplo projeto que esteriliza o mosquito.

Já no dia 22, também em Brasília, especialistas de todo o mundo vão se reunir para exa-

minar a viabilidade do projeto. Na segunda-feira, a Organização Mundial da Saúde (OMS) decretou o surto de casos de microcefalia e outros distúrbios neurológicos em regiões com registro de zika vírus como uma emergência internacional. Uma das conclusões dos especialistas é de que, com a vacina não podendo ser produzida antes de 2018, a meta hoje é um "combate agressivo ao vetor".

E o mundo vem perdendo a batalha contra o *Aedes*. Tanto na OMS como no Centro de Controle de Doenças dos Estados Unidos (CDC), a percepção é de que é de que os instrumentos de desinfecção são pouco eficientes e apenas contar com uma mobilização social não está dando resultados.

A nova estratégia, proposta pela AIEA, é a de reverter a expansão da população de mosquitos. O plano consiste em ex-

por mosquitos machos à radiação nuclear, tornando-os inférteis. Uma vez de volta no meio do mato, esses mosquitos não conseguiriam se reproduzir e a população geral teria queda.

A SIT (sigla em inglês para Sterile Insect Technology) já existe e consiste em colocar os vetores em contato com raios X ou Gama. A vantagem do sistema é de que os milhares de mosquitos seriam controlados, sem o uso de produtos tóxicos. Mas o grande obstáculo é o volume de insetos que teriam de ser inicialmente esterilizados. Para que isso funcione, os espécimes modi-

ficados teriam de ser superiores ao número de mosquitos machos em uma população autóctone em uma proporção de 10 a 20 vezes.

Na prática, milhões de mosquitos teriam de ser expostos à radiação. A própria AIEA estima que o plano teria maiores chances de funcionar em pequenas cidades e não em metrópoles como o Rio.

Ainda assim, os técnicos são otimistas. "Se o Brasil soltar um enorme número de mosquitos machos nessas condições, levaria poucos meses para reduzir a população. Mas isso teria de ser combinado com outros métodos", disse o vice-diretor da AIEA, Aldo Malavasi.

Outros países. Além do Brasil, países latino-americanos como Guatemala, El Salvador e México já estão em negociações, além da Indonésia.

NA WEB
Portal. Entenda como funciona a técnica
estadao.com.br/e/graficoradiacao

Source: Acervo Estado de São Paulo (04/02/2016)

From 2020 forwards, guidelines are emphatic about continuous guarantee of inputs for arboviruses control and the necessity of planning ahead. The local reality, however, is that there's no guarantee they'll be attended:

> We just demand. 'We want this'. If we're going to have it is another story. (...) What we do is to define which actions, from those listed in the national program, are better applied to the available resource from the state and the municipality. (Interviewee, B)

The oldest bureaucrat says that, from his perspective, there were only two moments of high investment: during the PEAa implementation, and during the Zika Virus outbreak. The coordinator from Recife complained about how difficult it is to ask for inputs:

> When we request some products, it takes a long while for them to be delivered, and sometimes when they do, it's a low quality product. Public bidding is too bureaucratic, and it takes too long. When management changes, it gets worse. (Interviewee C, own translation)

The local reality is a crucial aspect of the Dengue Program, and it's the focus of the next section.

6.2.3 Get down on the municipal level: the ups and downs of policy structure

In the previous section I talked about the type of political decisions made, generally speaking. However, decision-making can happen in different arenas, for both formulation and implementation. The *Aedes Aegypti* eradication program during the whole twentieth century followed the military campaign model: a temporary vertical operation with a single and central command. The practical implication is that decision-making was very centralised. Up until 1986, information got to the national level through the states and municipalities, while technical norms were elaborated by the Health Ministry and State Secretaries - the latest adapting national guidelines to the conditions of its region.

The 90s brought not only a democratisation process to Brazil, but also decentralisation of services to the municipalities, with regionalism and hierarchy to the network of health services - the introduction of SUS. This turns a switch in how Dengue Prevention is designed. When PEAa consulted PAHO officers, an eradication plan was approved, but the recommendation was for a vertical model, which was understood as an authoritarian model against the principles of SUS. Besides, PEAa argues that vertical programs failed because they were deactivated after the goal was reached, meaning they couldn't detect reinfestation. The idea was to do a great

eradication action, and then keep continuous structures of maintenance and monitoring for the mosquito presence.

So, for the first time, the plan was structured with centralisation of norms and decentralisation of execution: the national level steps back from executing endemic control, being just the formulator of epidemiological surveillance, while the states give technical support to the municipalities. All field operation structures were transferred to municipality management.

PEAa ended up also failing - it still had the notion of eradication instead of permanent control, and estimated costs reflected that (example on Figure 22, on Appendix A). However, the biggest criticism towards the plan at the time was directed towards the decentralised aspect. The excerpt on Figure 17 shows that specialists thought transferring the responsibility to the municipalities was a mistake (entire article is available on Figures 23 and 24 on Appendix B).

Figure 17 – Newspaper excerpt about decentralising the Dengue Program

Especialistas culpam municipalização

KÁTIA STRINGUETO
DA REPORTAGEM LOCAL

A falta de controle na prevenção de endemias e as falhas no processo de municipalização da saúde são responsáveis pelo ressurgimento da dengue e de outras doenças tropicais no país.

Essa é a opinião de quatro especialistas ouvidos pela Folha. Entre as causas do aumento dos casos de dengue registrados no país nos últimos dez anos estaria a descentralização do sistema de controle de endemias.

Em São Paulo, o controle era estadual e passou para a esfera municipal. No restante do país, o controle migrou do Ministério da Saúde para as prefeituras.

O problema é que o controle de mosquitos, como o *Aedes aegypti*, é complicado. Segundo Paulo Elias, do departamento de medicina preventiva da USP (Universidade de São Paulo), para que os municípios possam cumprir esse encargo é preciso dispor de estrutura, o que nem sempre ocorre.

Elias diz que seria necessário supervisionar o trabalho dos municípios para assegurar que todos estivessem executando adequadamente a prevenção.

Basta que uma prefeitura deixe de fazer a sua parte para colocar em risco toda a sua região, já que o curso do mosquito não respeita fronteiras administrativas. "Não é tudo que dá para descentralizar."

A professora de epidemiologia da Santa Casa de São Paulo Rita Barradas Barata, ex-presidente da Associação de Saúde Coletiva, diz

que a prevenção poderia ser municipal, desde que a gestão do programa fosse estadual.

O motivo, diz ela, é a complexidade da ação. São necessários peritos para a pulverização dos focos de mosquito e um planejamento adequado.

Os casos de dengue autóctone em São Paulo são um indício de que a lição de casa não foi cumprida pelas últimas prefeituras. "Se não há controle do mosquito na cidade, quando aparece um único doente, rapidamente a doença se dissemina", diz Rita.

A idéia da descentralização com repasse da responsabilidade para as prefeituras não está errada, segundo os especialistas. O problema é que o serviço e a verba para combater o mosquito foram repassados aos municípios, mas o controle de qualidade, não.

"Houve uma transição atabalhoada de poder, que vai levar um tempo até as prefeituras aprenderem a fazer o controle do mosquito corretamente", diz Rita.

"Sempre que se afrouxa o controle do mosquito, a doença volta", afirma o ex-ministro da Saúde Adib Jatene, autor de um plano de erradicação do mosquito que nunca saiu do papel.

Segundo o infectologista Marcos Boulos, da USP, o problema é que o país não tem política nacional para controlar esse tipo de doença. "Ele (José Serra, ministro da Saúde) pode até colocar a culpa do crescimento do mosquito nos municípios, mas o que falta mesmo é uma política nacional de controle."

Reinfecção por vírus acarreta riscos maiores

DA REPORTAGEM LOCAL

O maior risco da presença do *Aedes aegypti* num local é a facilidade com que o vírus da dengue se dissemina.

Há quatro tipos de vírus da dengue. Se uma pessoa é reinfectada por vírus diferentes, aumentam as probabilidades de ela contrair a forma mais grave da doença: a dengue hemorrágica.

O problema se agrava porque o controle dos focos do mosquito no Brasil é precário e porque o país já abriga pelo menos três tipos de vírus. Em uma infecção secundária, o risco de ter dengue hemorrágica é de 1%. (KS)

SANATORINHOS
Ação Comunitária de Saúde

EDITAL DE CONVOCAÇÃO
Assembléia Geral Ordinária do Conselho Deliberativo

Nos termos do artigo 18° do Estatuto Social, ficam convocados os Srs. Conselheiros, para reunirem-se em Sessão Ordinária na sede da Entidade à Rua Condessa de São Joaquim n° 183, no bairro da Liberdade, em S. Paulo/SP, no dia 30 de abril de 2001, às 17h30 em 1ª

Source: Acervo Folha de São Paulo (09/04/2001)

The elephant in the room is that work capacity varies greatly between municipalities, and the effects were felt. There's insufficient human resources and institutional resilience, and

limited funds. Local epidemiological surveillance couldn't cope, and more outbreaks happened. This limitation is recognised by PNCD in 2002, and a lot of effort is directed to fix the situation. The changes in financing discussed in the previous section are also a product of this initiative. PNCD proposes greater articulation between governors and secretaries from states and municipalities through institutionalisation of integration committees, so these actors could monitor the concerned indicators.

Besides the need for support, PNCD justifies articulation with the natural aspect of a vector not knowing territorial or political-administrative limits. Local context and experiences need to be incorporated to the policy. Guidelines from 2005 slightly modify this narrative, which still sounded very unilateral: when local surveillance is qualified, not only implementation is better, but also the data and information produced is more consistent and reliable, which strengthens planning from state and national levels. In practice, national and state guidelines are elaborated in collaboration with all levels, and legislation starts to be put in place to cover for the limitations still in place.

Pernambuco's state plan from 2008 makes a diagnostic, though: articulation committees still don't work in practice, as they are unstructured, with little action (meetings don't happen), with no shared knowledge between other health councils or councils from other policies, such as social movements and social control development.

There's an attempt to mend the situation by creating the Health Pact, a policy with the goal of improving health services by defining local goals for a group of sanitary commitments, creating a strategy to reach those goals, and regular follow-up of results. The Ordinance No. 3252 of 2010 substitutes the certification of surveillance actions for the adhesion to the Health Pact, giving an incentive for municipalities to assume the management of decentralised actions, and in 2010 Dengue enters the list of sanitary priorities for the Pact. At least in the state of Pernambuco there's not much documented about impact of this policy. In the 2008-2011 management, the state is very incipient, with only two municipalities adhering to the Pact, while two others and the state government were still on the works. The following state health plans from 2012 and 2020 mention the policy existence but don't update adhesion status.

The institutionalisation of integration between the three government spheres is a great target of the following decade. Guidelines increasingly suggest mechanisms to facilitate articulation - in 2009 through assigning state secretaries to support the elaboration process of the municipalities' health plans, delimiting shared responsibilities when fighting Dengue (mainly

in promotion and social mobilisation) while suggesting formal work groups to coordinate them; in 2010 by reinforcing that municipalities are responsible for basic non shared actions, while articulating shared actions in inter-managers committees.

Geographical integration starts to appear in 2010 when there's a recommendation of regional planning for actions that surpass municipalities frontiers. This is made formal by a Decree No. 7508 from 2011, creating the "Health Regions" created by the states, grouping neighbouring municipalities within or inter-state where there's a stipulated minimum offer of actions and services.

State and municipal plans from 2012 forwards still point out the emergence of local weakness, a still too fragmented and irresolute healthcare system. There are concerns, but also optimism about the advances made. In 2018, Recife's plan goes through a revaluation and restructuring process, based on integration, decentralisation and social participation.

The current situation is given some perspective by interviewees, when talking about complying with national norms - which go from routines to products used:

> In general, it's a very vertical process, which is historical from the National Program. It's good for some things and bad for others, because it depends on the autonomy without risks. It's dangerous not to be aligned with the national strategy. (Interviewee B, own translation)

Surveillance is indeed done through articulation and constant meetings to analyse epidemiological status and monitoring data, working in its totality on the three spheres of government. Direction and prioritisation of actions are based on problems found in these meetings and from central information systems, at first with the technical team, and then with management teams.

What they say is this isn't a spontaneous process for the municipalities.

> When the municipality doesn't have the structure, or it has a structural deficit, then we as state agents come in with equipment, inputs, and sometimes, actually most of the times with human resources too. Since part of the emergency actions we need to complement with human resources, from the state or from the regional management, we have to check, look, it has a routine and if it's not working, and it reaches an emergency situation, we have to act or guide them through emergency transactions already established. Unfortunately, for some municipalities this doesn't work spontaneously. It depends on us to give them this support. In fact for most of them, they need us to do the analysis and say, 'hey, you're in this situation, change it, let's articulate the actions, we need to change what you need to implement' and we delimit what support the municipality needs, including for management. (Interviewee B, own translation)

Most of the time the municipality doesn't have the structure to maintain a routine or even inform of emergencies, so the state has to follow their activities very closely, and give support with equipment, inputs and human resources. It's not abnormal for routine issues to be beyond a municipality's governability, leaving to the state to make necessary demands to the national level, sometimes even beyond the original health plan - analysing the profile of each municipality but still following the national rules.

They emphasize that the Dengue Control policy would be better implemented if all the regions had minimum structure for that.

> In my perception, the operation of surveillance in all three spheres, it's when it actually works. It's in its totality that you can extract from the local level its maximum potential. It needs to be able to pass it to us, and we need to pass it to the superior level: everything that is diagnosed, notified, in good time, because it will initiate good timing actions too. Save lives, avoid an endemic to become an epidemic. (...) Today we don't have the necessary structure to act timely depending on the situation. For example, depending on the caliber of the municipality we can't give it the necessary support. (...) An epidemic is not fixed at once, and from one municipality it spreads to one, two, three or more municipalities in the same region. Depending on the situation, we don't have support, but it's not only us, the regional (management) doesn't, the municipality doesn't. So, the golden situation for us would be having all the structure, be it equipment, or the sufficient amount of people to timely attend to an action. (Interviewee A, own translation)

Continuity is also way easier for states and national governments:

> Their (municipalities) transition model is more fragile. Traditionally the municipality loses the ACE. We fought for it, so there was a legislation, which is not recent, it's from 2006, it says that ACS and ACE should be hired through public selection, so they can't be fired, they're permanent part of the local bureaucracy. The legislation also says that these agents can be hired for a fixed term in situations defined by the constitution. Like, I have ten (ACE), but I'll hire ten more that will stay during an epidemic during a period of two, three, six monts of actions. But we don't see this happening as a rule, many municipalities hire ACEs outside the law, through political appointments. (...) So, these are people that receive precarious training, if at all, and when a new management comes in all the personnel is substituted because the manager wants to capture its own personnel. (Interviewee D, own translation)

According to them, this ends up paralysing vector-control activities. In their words, neither the prefects nor the legal controlling body (*Ministério Público*) care about the situation. Because of fragile employment relationships, information is not properly passed over, impeding the continuity of processes.

This is obviously conditioned to the capacity within a municipality. Recife, being the capital city of the state of Pernambuco and an economic centre, is not much affected by this dynamic. There's a certain autonomy even to the extreme side of the policy, the implementation agents. Sanitary districts conduct their own administration and prioritising, including by restructuring their internal organisation, which isn't the reality of many municipalities.

They are not exempt from integration difficulties, though. For implementation of monitoring actions in buildings of state or national ownership, for example, it's not as easy as it should be - unless the initiative comes vertically:

> Our (the government spheres) partnership is hard to happen in many times. Sometimes it does, but it's costly. We have strategic points, places where it's easier to find proliferation sites (...), so some hospitals here, for example, the Oswaldo Cruz, we have to give it some attention (...). We have to do some corresponding, since it's a state hospital, but it's difficult to go through. This happens with national or state agencies. We hade some situations with the INSS (Brazilian pension system agency) building, we executed many inspections they required themselves (...) so it's easier to work like this. (Interviewee C, own translation)

6.2.4 Cake flavour is arboviruses: the (not always) quiet role of ideas and interests

"The policy is like a cake: we all have the basic recipe, and each manager prefers the cake in a way: sweeter, or with more filling, etc" (Interviewee E, own translation)

A very loud example of preferences shaping policymaking happened way before Dengue was an issue in the country - or World Health Organisation existed. In the 1920s, the most similar organisation was the Rockfeller Foundation, which came to Brazil with the mission of helping eradicate yellow fever.

One of the problems faced was the divergence between Brazilian sanitary doctors (*médicos sanitaristas*) and the Foundation. The doctors believed the Foundation was just trying to advance North-American imperialism in Brazil and discredit Brazilian research. A compromise was reached once the Foundation proposed national interventions against yellow fever in the entire country, something the Brazilian medical force had been trying for a while (BENCHIMOL, 2001; CAFé-MENDES, 2017). This is a case where ideas were put aside for a common interest.

Many times these things are not so clearly stated, but we can pick up hints here and there. One element that has been mentioned before is the relationship of the policymaking centre and the agents involved after the decision is made, which could be other government spheres or the affected population.

Preventing yellow fever during dictatorship would result in authoritarian measures, quite explicit in the Decree No. 785 from 1969: it's actually an article of the infamous Institutional Act No. 5 (AI-5), which passed through the hardest legislation of the period. The article is about epidemiological surveillance, and it inflicts penalty on whoever makes it difficult for sanitary agents to execute inspection or measures for prevention of diseases. The writing is vague, perhaps deliberately.

By the end of the 1970s, an agent's conduct is written to be more pacifist in technical manuals: if a person refuses to let them into their house, the agent may explain the benefits of the campaign, but never get into discussions or arguments. This becomes a permanent value, except for a brief hiccup in 2016, during the triad epidemic, when a temporary legal measure (*Medida Provisória*) authorises agents to force-entry houses with suspect breeding sites (excerpt on Figure 18, full article on Figure 25 at Appendix B.)

Figure 18 – Newspaper excerpt about measures taken during the Zika epidemic

MP permite entrada à força em casas

● Vale desde ontem a Medida Provisória 712, que autoriza o ingresso à força de agente de saúde em imóveis públicos ou particulares para combater focos do *Aedes aegypti*, no caso de situação de abandono ou de ausência de pessoa que possa permitir o acesso desse profissional. Se necessário, o agente público competente poderá requerer o auxílio à autoridade policial.

Entre medidas que podem ser executadas, a MP ainda cita as visitas tradicionais a imóveis públicos e particulares para eliminação do mosquito e de seus criadouros e a realização de campanhas educativas e de orientação.

Source: Acervo Estado de São Paulo (02/02/2016)

Going back to chapter 3, the starting point for developing a welfare state model is the notion of citizenship. The Law No. 8080 that creates SUS expresses that health is a fundamental human right. This is an idea that completely shapes Brazilian's health system.

The *Aedes Aegypti* campaign at the time was facing an interesting dilemma: centralisation might be more efficient in terms of implementation, but for financing it made the policy vulnerable to the change of interests, taking into account the neoliberal reforms that tried to limit budget of public services.

A dispute may exist even between forms of prevention: in the case of yellow fever, vaccination was available, and there was a tension between control of the urban vector and

promoting immunisation. In this specific dispute for emphasis, vaccination campaigns won (BENCHIMOL, 2001).

The principles of SUS became a guideline for future policymaking, and it was based on them that PEAa designed the new model of mosquito eradication. Another moment where a particular idea flows from the plan is what goals it has. PEAa sees the health education process as a search for population's credibility on public services. In fact, providing frequency and continuity is said to be the way to reach such credibility - and avoid rupture of political and institutional relations.

Policy preferences are also an elementary component of policymaking. One problem with PEAa was the focus on chemical attacks (insecticides). In the previous section, I mentioned PAHO's officer opinion on it during epidemics: they're good for pictures. Good pictures in politics can result in positive electoral results, as it's said to be the case during the implementation of this plan (BENCHIMOL, 2001).

This is not exclusive to PEAa, but PNCD, when substituting it, picks up how previous programs were centered in chemical fight and that this should be changed - the start of an environmental agenda in epidemiological surveillance. This a theme that becomes more salient in subsequent documents and registers. Guidelines explicitly mention prioritising mechanical removal of breeding sites, only resorting to larvicide for recipients that can't be moved.

Insecticide-spraying cars like the one pictured in Figure 14b, popularly called *fumacê*, become less and less common after PNCD.

"(...) it's working with poison, but this comes from the municipalities' culture. You don't see the fumacê car anymore." (Interviewee E, own translation)

In Recife, tells me the local coordinator, this agenda has caused divergence on occasion. For a while, the municipality had been using biological control of breeding sites since it's more environmental friendly. When receiving inputs from the Health Ministry, the available larvicide is chemical. The city management decided to not use it, and make its own investment in the type of input of their preference. Another measure taken due to this preference directly affects implementation: encouraging the rational use of products, like avoiding throwing them without caution on treated sites, as they're essentially poison.

This all depends on, once again, the culture of that municipality. Within the technical norms (which is what one interviewee calls the basic recipe of cake in the quote I used in the beginning of this section), each management has its own preferences and priorities. The current

management of Recife (2023) has a technological view for Health Surveillance, investing in the use of apps and portable electronics.

6.2.5 Of mosquito and men: the humanisation of the fight against the vector

PEAa had issues, but took one step that was included in all following programs and guidelines, which was making the policy process more horizontal. For example, PEAa differentiates community mobilisation (which is to instruct and give information) from community participation (a joint process of construction and decision), and it actively proposes participation. It classifies health professionals as social actors that go beyond the implementation of a plan, they also should interact with the population, and use pedagogical and methodological proposals that discard previous authoritarian practices.

Instead of being just recipients of the policy, or even barriers to vector-control like just some decades before, the population is considered an important part that should get involved. PEAa mentions experiences in the municipalities of Recife, Salvador and Niterói as references that, when there's political decision and disposition to negotiate, health agents can find ways of access to areas where marginalised populations live.

PNCD proposes to keep this side of PEAa, but with good implementation. Dengue Control is not just a ministry program, but a common interest activity. Health agents are trained to do their activities together with the residents of inspected places, sharing information and discussing alternatives for their personal scenario. In subsequent guidelines, there's the recommendation of including the community also in the formulation stage, sharing knowledge.

The program then incorporates aspects related to the social side of the arboviruses problem. One example cited by Recife's local coordinator was dealing with hoarders. Hoarding is treated as a psychological condition, and agents can't just come in and remove the person's stuff. A slow work of conversation is made to convince a hoarder to give away at least parts of whatever they're keeping, and this work may take multiple tries.

Health education is thought for the general population, but the 2009 guidelines bring in another target, ignored until now: many municipal managers also need to develop sanitary conscience, even the ones responsible for health systems. This is a challenge attributed to health professionals, and a step that helps to diminish the notion of us versus them in that dynamic.

A final piece of the integration puzzle, the one that reminds us that it's people we're talking about, is the health professionals. Specifically, ACE and ACS.

ACE are responsible for the implementation of this prevention policy. Yet, for such crucial of a role in the vector-control chain, they were surprisingly neglected for a long time. Manuals from the twentieth century focused on giving guidelines of field work to those agents, and never touched their own health or safety.

When eradication ideas were still in place, implementation agents were called "Guards". They become Endemic Agents - ACE - in the 1990s. PEAa talks about them as human resources and hiring events, not people. A point is made: when the executing unit changes, the human resources changes too. Clientelistic hiring is prevalent during this time.

In the decentralisation process of this period, ACE were all laid off, and only re-integrated to the health system in 2003. The attention turns to them at this time, and how this profession should be treated better.

First, in 2003 ACE are incorporated to SUS, making their work connection more solid. Legislation from 2006 gives worker rights to the class, and financial incentives are approved, as per the political decisions section. The Law No. 13.595 of 2018 reformulated a considerable amount of legislation in the surveillance area, and one of the changes was the regulation of ACE work conditions and responsibilities.

This law gives even more rights and health protection measures to endemic workers. At the municipal level, though, those rights are still fragile to this day, which is an important bottleneck to the continuity of preventive policies and health surveillance.

The notion of integral attention to health eventually brings up how manuals should be improved by also approaching health and safety of ACE. In 2019, a manual with this focus is published, hoping to promote development of: work conditions, democratic and participatory construction of workers health at SUS, citizenship strengthening, and lastly, to diminish injustice and inequality.

6.2.6 An endlessly untold story: shoot the messenger and ignore the real war

I'm going to start this last section with a personal anecdote. I was a Visiting Student in the University of Oxford for a semester. At the time I was deeply unsatisfied with my study topics, and I was in the middle of completely changing my research theme. I had a general idea that I wanted to study something related to public planning, but I needed to do a lot of zooming in yet. So, this one afternoon, I go to the weekly Latin America Centre seminar, where

a professor from the Spatial Ecology and Epidemiology Group (department of Zoology) would present a research about Zika Virus Epidemics in the state of Pernambuco.

You reader can guess this seminar inspired me to pursue my current theme, and it's true, but this is not the reason I'm telling this story. The professor presenting researches computational and genomic epidemiology. And I'll never forget him recounting how their team's calculations and theoretical expectations of mosquito incidence in Pernambuco didn't make sense - why would there be more breeding behaviour during the summer, when there's no rain? Where does the mosquito puts their eggs? They needed an anthropologist to tell them that this happens because a substantial part of the population doesn't have water supply in their homes, so they need to stock in reservoirs, which become perfect environment for mosquito reproduction.

The professor was baffled, and I was also baffled, for different reasons. For me, being born and raised in Pernambuco, this is a totally obvious information. We all know that - we are taught about that on TV, at school, by health agents that regularly knock on our doors.

Reading all the material for this analysis, the knowledge is also there: guidelines mention that arboviruses is a multifaceted issue. Policymakers know exactly why eradicating the *Aedes Aegypti* is so hard: water access inequality, urbanisation, poverty, lack of sanitation, deficit in solid waste policy. Interviewees say those topics are all talked about during education actions. Involved departments and agencies are invited to collaborate for those.

And yet, there seems to exist a gap between integrated education and formulation for social causes of Dengue. Integration is focused on the means rather than ends, the notion that this is a social problem exists, but actions in this way are lacking. PEAa presented proposals for solving the origin problems, budgeting actions of sanitation and water supply for the municipalities. There's no documented evidence on my end that indicates those proposals were followed.

One interviewee says that it's very common for the management to attribute responsibility for Dengue incidence to the population:

> We go to these meetings with the management and they say, the population doesn't help, why don't they just cover water reservoirs? And then I answer, yes, they could be more helpful, but why don't they have tap water everyday? Or adequate sewage? (Interviewee B, own translation)

Which goes to show that, when copying the model of fighting yellow fever, the Dengue Control Program also copied the basic problem of attacking the consequence of urban issues,

not the causes. This was already a criticism for that policy (CAFé-MENDES, 2017). Vector-control rarely acts on the conditions that permit the vector to keep proliferating.

Obviously, at such an advanced stage of urbanisation, globalism and climate change, implementing multi-sector solutions is way harder than it was 120 years ago, when vector-control campaigns started. However, some steps could still be taken on that direction. For example, why didn't the Oxford professor know about water reservoirs? Because this particular info wasn't available in epidemiology data is my guess.

The use of evidence in Dengue Control is almost strictly from clinical and epidemiological data - this data is informing technical and political decision-making. Epidemiological data has advanced a lot, having started with notifications of presence of mosquito and researching larval sites, to sophisticated data collection methods like the *ovitrampas*, and feeding information system to the elaboration of mosquito indexes like LIRAa.

In 1986 there's the introduction of new type of data, like demographic and environmental variables, morbidity, mortality, notification of outbreaks and unusual diseases, life conditions, access to goods and services, and forms of production. In 2005 some of these variables have specified indicators: individual characteristics (sex, age, ethnicity, marital status), activities (job, sport practice, religious practice, habits), and life conditions (social class, economic status, environmental conditions). The chain of information-decision-action is emphasised.

There's even more variety of data added in 2010: water supply, sewage, trash disposal, housing, access to transport, security and leisure. Local values and culture are recommended as reference for grouping data and describing the problems.

In 2014 a regression seems to happen, since all mentioned collected data is quite clinical. The 2022 contingency plan for arboviruses gets more sophisticated, creating risk scenarios and complex measures of epidemiological situation through incidence rate of mosquitoes, control diagrams, and epidemic curves. It says that available resources will be conditioned to the information gathered by the study of this data.

This issue, as expected, goes back to financing. Recife's local coordinator even says that the numbers they work with "generate resources to the prefecture". This is because epidemiological data is the one used to establish priorities, resources allocation and programmatic orientation, according to the SUS legislation, Law No. 8080 from 1990. Other type of data is not paid, therefore, it's not worth the effort to collect.

If the issue is a social problem, social data should also be, somehow, rewarded. There's incidence of mosquito breeding sites in an area: OK, but why? Is there any social explanation for this? If this type of data is collected, there's no register of it.

Why are specific direction and prioritisation decisions made, what is the difficulty driving that decision? Let's go back to this aspect and think, is there something that can be done differently while considering what makes the difficulty exist, during implementation of the policy? This is the type of memory that is hardly mentioned, but seems to be behind all prevention policymaking happening.

As of January of 2023, a vaccine to prevent Dengue is under analysis by Brazil's National Sanitary Surveillance Agency (ANVISA), which means starting a different stage of prevention policymaking for the disease. Vector-control programs were a direct inheritance of the fight against Yellow Fever, the good and the bad. Before 2019, an immunisation campaign would be a different matter: Brazil's sanitary surveillance bread and butter, if left to do their thing, it would be smoothly implemented to fruition. After the COVID-19 pandemic, propagation of antivaxx fake news, and resurgence of eradicated diseases, I'm not so sure. Will a Dengue Vaccination Program suffer from the same mishaps as Yellow Fever's Campaign, a never-ending cycle of human versus human, while the mosquito watches?

I'll end this analysis mentioning the WHO's quote on my Epigraph, what are we going to do about it?

7. DISCUSSION: ASSOCIATIONS AND MECHANISMS

A quantitative approach is able to find general associations and trends, while a qualitative approach tries to identify mechanisms and motivations. A convergent mix-methods design is a way to concatenate findings into a single line of thoughts, where we evaluate if there's a convergence or a divergence of results in both analyses.

Each methods has its merits, and some findings that are exclusive to them. So, before getting into the convergence analysis, let's take a look in some of those.

On the quanti side, in terms of repeating trends, visual descriptive inspection helped me identify two groups of countries: Brazil, Chile, Costa Rica and Uruguay on one side, Dominican Republic, Mexico and Paraguay on the other. The first group fares better in terms of how much they spend on health, and positioning on my POSTI, for example, than the second group.

This pattern is repeated when describing the hybridisation of financing schemes for health system models. Brazil, Chile and Costa Rica have stable prevalence of models, while Dominican Republic and Paraguay have consistent instability, going through all the models over time. Mexico and Uruguay change places in groups this time though, with Mexico having certain stability of financing scheme choice, while Uruguay seems to change it every decade.

Considering the political and economic historical trajectory I described in chapter 3, this is compatible with what we expect to see from them. The first group has always been bigger economies or stable and aligned political systems.

On the quali side, first let's acknowledge how the Dengue Program follows the exact issues described by prevention literature (CAIRNEY; DENNY, 2020; BOSWELL, 2022): it's a multidimensional question that ends up being evaluated through narrow indicators that don't reflect the roots of the problem.

Second, the use of evidence also works as expected. While epidemiological data is the great focus of collection, policymakers keep taking into consideration other types of information. Let's use Bowen & Zwi 2005 list to illustrate for the case of Dengue:

1. Knowledge from consultation with groups or networks: organisations such as PAHO/WHO, or the Rockfeller Institute back then, keep appearing as technical groups who offer guidance to Brazilian preventive policies;

2. Ideas and interests: the notion of citizenship, the population as a participating element of the policy and ACE as recipients of workers' rights are some examples of defining aspects of the Dengue policymaking;

3. Use of resources and opportunity costs: financing a continuous policy has been the source of tension throughout the history of *Aedes Aegypti* control. It breaks the fallacy of preventive policies being cheap. It's not cheap if they're paid for in the long run;

4. Pure politics: in the past, arboviruses ceased to be a salient problem once infestation was considered controlled. Health crises are the biggest trigger to boost funding. Chemical methods of mosquito control had been chosen for their electoral view before, and are currently unpopular due to environmental agenda.

The main theoretical themes I worked with, though, are present in both analyses. I use a Side-by-Side Joint Display to present the integrated results (Table 26), a very common mixed-methods visualisation technique, especially for a Convergence Design (CRESWELL, 2015).

Table 26 – Results: side-by-side joint display

Construct	Quantitative results	Qualitative results	Analytical integration (convergence or divergence)
Policymaking Stability	Negative relation to prevention; Force of association conditioned to quality of government; Inconsistent	It matters more at the implementation stage than formulation due to policy feedback	Convergence
Decentralisation	Consistent negative relation to prevention; Strong association	Centralised formulation and financing guarantees continuity, but local instability hinders implementation	Convergence
Health Systems	Positive relation when compulsory schemes increase; Negative relation when governmental schemes increase; Low association	Fragmentation of services causes lack of structure to implement policies	Convergence
Ideas and Interests	Not being moderate makes a slight difference in the 2010s Left cabinets have negative association in the 2000s Right cabinets have positive association in the 1990s	Ideas make incremental changes in formulation, and preferences mold the style of implementation but not the policy content	Convergence
Quality of government	Consistent negative relation; Matters more chronologically than in retrospect,	Clientelism and lack of bureaucracy at the local level hinder preventive actions	Divergence
Path Dependence	The 2000s have better fit models to explain 2010s	There were big changes of conceptualisation in the 2000s	Convergence

First concept is Policymaking Stability, measured by the POSTI in the quantitative stage. I was expecting a positive relation to emphasis in prevention, but econometric tests showed the opposite. However, another finding was how this particular association was actually conditioned to the presence of Quality of Government in the model. I argued that this is because quality of government was more representative of permanent State conditions than POSTI.

The case study showed me that changes in the policymaking arena don't make much difference in how the policy was formulated, as it had been inherited from the Yellow Fever Control policies, following a strong epidemiological paradigm (positive policy feedback) that naturally evolved with time. The biggest difference is at the implementation of the policy, which is dependent on the stability of the management. Since implementation happens at the local level, which is more vulnerable to changes due to a fragile transition model and lack of structure. In municipalities where these two factors are not weaknesses, policymaking instability won't matter as much.

When questioning competing theoretical explanations in chapter 2, I defended that the nature or type of policy determined which was its more conducive policymaking environment. Perhaps this perspective should also be applied to Policymaking Stability: at which stage it will have more of an impact, formulation or implementation? Having decided that, at which arena does this stage happen? Making this conceptual and measurement choices, a comparative study can be conducted with more theoretical precision.

Decentralisation is the one constant in both numerical and textual data. Tests corroborated my hypothesis that associated more decentralisation to less emphasis in prevention. Empirical literature on decentralisation is tentative at best in giving more resolute answers about its effect on policies and decision-making. I argued for centralisation under the same logic of type of policy being important, and preventive policymaking would need centralisation.

The tension between centralised and decentralised strategies for preventing Dengue and other vector-based epidemics is a recurrent struggle in the health surveillance history. On one side, centralisation and vertical policymaking is associated with authoritarianism, which was explicitly fought against in the changes promoted in the 1990s. Leaving the implementation responsibility to the local level had its fair share of criticism, though, once it became clear that most municipalities aren't able to execute epidemiological surveillance at best (or any) capacity.

Many steps were taken since then to this day towards balancing the harmful differences between municipalities, by bolstering funds transfer conditions and creating incentives to co-

operation and integration between government spheres. While a lot has been done in this way, any bureaucrat will tell you this is still one of the biggest obstacles to implementing preventive policies, as decentralisation without support decreases the resilience.

Decentralisation is not only a fiscal matter, it also affects health systems. Using financing schemes as a proxy, there was a feeble association to be found, even if it showed some significance - positive for compulsory insurance schemes and negative for governmental schemes. I argued that a bigger proportion of governmental schemes meant the model was closer to a national health system, which was less fragmented. My theoretical expectation was that more fragmentation meant less resilience.

The case study showed how, perhaps, measuring fragmentation through financing schemes only is not enough. Financing flows vertically from decision-making and formulation centres to the implementation arenas. However, delivery was where the limitations were more pertinent. Decentralisation is the best tactic to reach all the population, but differences in capacity are still too notorious to ignore. A possible strategy is to add delivery schemes as a variable, and check if it fares better in potential of explanation.

Cabinet ideology is used as a control in quanti-tests. I had no theoretical expectations, but the variable delivered some intriguing results. Literature hasn't showed much difference between left and right governments, and this is still found for my chronological models, where both left and right-wing cabinets were significant and positive: meaning the only difference for emphasis in prevention was being moderate or not. Going back in time was interesting, though: it showed a bigger force of left cabinets in the 2000s, in significance and magnitude of association, on the negative side. In the 1990s they lose force to the right cabinets, which have weak but significant positive association.

I already discussed the political history aspect of it, what with the 1990s being the period of neoliberal reforms, and the 2000s being LatAm's left turn. The main takeaway is that policy formulation entered a positive policy feedback stage since then, making change of ideology after the 2010s not relevant for policy choice.

The biggest shift of ideas that affected policy formulation, according to my case study, was in the 2000s. In fact, guidelines which presented changes at the time went back to incremental revision mode in the early 2010s. Preferences and culture are still present in municipalities, but this is only detected at the implementation stage: like one interviewee said, the cake is the same, the local manager just chooses the flavour.

What this is telling me is that ideas should be studied considering their time-sensitive characteristic, and conditioned to a policy feedback cycle. It's possible for ideology to become an important variable once again when studying a post-COVID pandemic world, considering that ideas about prevention went back to being similar to the Yellow Fever immunisation resistance era.

The second control variable with no theoretical expectations was quality of government. This variable has had inconsistent effect in empirical studies, and it shows strong negative association in my models. I took a guess that in countries where there's more quality of government, there's also enough structure and incentive to go for curative care. Previous quality of government is not as associated to emphasis as current values.

This is the only construct with divergent results between quanti and quali analyses. Qualitative evidence has shown that preventive actions are hindered not only by lack of structure, but also by lack of qualified bureaucracy and by clientelistic hiring processes. The mechanism is that these conditions are a barrier to continuity of the preventive activities. Many municipalities, for example, need support to even activate emergency warning mechanisms. The lack of monitoring makes them more susceptible to epidemics, meaning an even bigger impact when an eventual outbreak happens - if there's no capacity for epidemic prevention, there's even less for epidemic response.

This divergence might be a good starting point for theoretical debate. Why this happens? Is there a missed mechanism? I'm going to take another guess: quality of government in the comparative study is aggregating a national impression of a phenomenon that probably makes more sense locally, or at least at the implementation stage.

At last, my whole theoretical argument is built on path dependence. In the quantitative analysis, I lag the independent variables in 10 and 15 years. A threshold of association is shown there, with 10 years lagged models greatly increasing fitness, significance, and magnitude of association for all variables, while 15 years lagged models showed a decrease. The fact that this happened to the model as a whole not only shows the impact of institutional historical trajectory on current policy choices, it also validates the institutional matrix concept and the systemic analysis framework. There's no single great explanatory arrangement, the combination of all of them creates the policymaking environment, and in this environment policy choices are made, while embedded with policymaking memory.

8. FINAL REMARKS

My objective for this research was to understand political factors that lead to emphasis in prevention, arguing for policymaking arrangements, interests and ideas as those factors. I also make a point of the effect of path dependence conditioning how my whole framework is associated.

In my findings, summarised in the Discussion chapter, there's a convergence of quantitative and qualitative results between all main theoretical themes except for quality of government. Some results don't follow my initial assumptions, like policymaking stability having a negative relation to emphasis in prevention. There are two possible explanations for that: either Lijphart's argument in favour of more actors as a means to more stability is the correct approach, or my interpretation of the POSTI building is wrong and it measures instability instead. The case study shows that, either way, the stability at the national or even state level is not as important as the local level stability.

Others perform better than expected, like decentralisation. The case study reiterates the difference between national and local policymaking as an important mechanism that could be influencing those results.

History is not only important in theory. I showed on both analyses how path dependence is a key factor in policy choice. For the case of Latin America, the 2000s were a period where pivotal politics happened, what if the ascension of left parties and formulation of local control instead of wide elimination Dengue programs. Quanti and quali findings are solid on how the choices made in the 2010s are a byproduct of those politics in the previous decade.

Talking about choices, my own decision to make a systemic analysis, supported by theoretical institutional literature, made sense in the empirical stage. There's not one or other factor with main explanation power, but rather the models and factor work as a whole picture. Quanti models have better fit statistics when variables are grouped, and quali findings show a composition of actors' interests, general ideas and implementation designs being complementary in building the trajectory of the Dengue policy in Brazil.

Above all, this work makes an adamant theoretical and empirical point on how it's futile to ignore the politics of health policymaking. Political factors are as much part of the formulation and implementation as the technical ones.

These findings raise two important implications for theory development in policy choice: first, the most common variables used in the studies of the area don't have universal effects. Once you specify different types of policies, the dynamics surrounding them change. For preventive policies, fragmentation of the policymaking structure (aka decentralisation) doesn't seem to be conducive.

Also, stability and resilience are more relevant at the implementation level than the formulation level. This cannot be generalised for other types of policies. The second implication is that in some historical contexts, the memory of those factors becomes crucial to understand what happens next, even when said context changes.

As with any study, I have dealt with limitations, biggest one being the data I used, in both quantitative and qualitative stages. For qualitative data access, the effort is dependent on articulation. Unfortunately, time-series cross-section data that goes far back in time in the most adequate format for comparability cannot be produced. However, following the increasing trend of transparency, it's possible that in some years we'll have great data that will improve following studies and permit replication of this one.

The possibilities for future research are infinite as this thesis doesn't have the capacity to tie all ends of the topic. Using expenditures in prevention, there are multiple comparisons that could enrich the discussion. Countries from other regions can be added, to see if associations are consistent, or if historical differences are an unobservable effect. Or, instead of yearly measure of arrangements, we can observe the change in them from one unit of time to another. We can also switch the DV from formulation and implementation to actual results of specific preventive policies, replicating a branch of empirical studies.

It's also possible to keep the LatAm sample, but change methods for a more quasi-experimental approach, such as comparing difference in expenditures between two moments in time, like before and after an epidemic episode. Expenditures can also have a path dependence effect in themselves - does a previous prevention budget from, say, ten or twenty years ago, have an association to current values, considering the high auto-correlation between serial budgetary data?

Dengue Control is a great case study that still holds potential of exploration. If it's possible to access other actors involved in the Dengue policymaking, uncovered details could be exposed, especially actors who were present for the beginning of the policy history, a focus transition moment from yellow fever to dengue. On smaller municipalities, how do they experience the implementation, or the integration with state and national actors?

Formulation actors, how do they balance scientific evidence from political interests, what do they do with the collected non-epidemiological data? After the advents of Zika and Chikungunya epidemic outbreaks, can we identify some learning experience in planning for inevitable future epidemics, new arboviruses? And moving away from Brazil, a comparative case study between the policies from other countries in LatAm could assure external validation to the findings in my work, perhaps implementing other case study methods, such as the Institutional Analysis Development framework (IAD).

This topic is instigating, and a research agenda is open for a myriad of theoretical, methodological and empirical approaches.

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A. Appendix - OLS Assumptions Tests

First, I run simple OLS models to test for the assumptions I was concerned about. We can identify auto-correlation through heteroscedasticity tests, and visual analyses of residual vs fitted values and distribution of residuals (HAIR et al., 2005). I'll do two with no controls, in which in one I use the government schemes proportion for health systems, and in the other I use compulsory insurance schemes.

Table 27 – OLS models with standard errors

	Dependent variable:	
	emphasis on prevention	
	(1)	(2)
PolPol	−0.385**	−0.534***
	(0.177)	(0.135)
PolVot	−0.129	−0.150
	(0.108)	(0.094)
gov_schemes	−0.003	
	(0.003)	
insur_schemes		0.004***
		(0.001)
taxd	−1.051**	−1.435***
	(0.446)	(0.312)
Constant	1.354**	1.581***
	(0.532)	(0.312)
Observations	45	45
R^2	0.218	0.367
Adjusted R^2	0.140	0.304
Residual Std. Error (df = 40)	0.096	0.086
F Statistic (df = 4; 40)	2.791**	5.798***
Note:	*p<0.1; **p<0.05; ***p<0.01	

OLS model summary is on Table 27. I abstain from interpreting the results for now, and focus on testing regression assumptions on these models. The distribution of residuals for both models on Figure 19.

Figure 19 – Residual Histograms

(a) model 1

(b) model 2
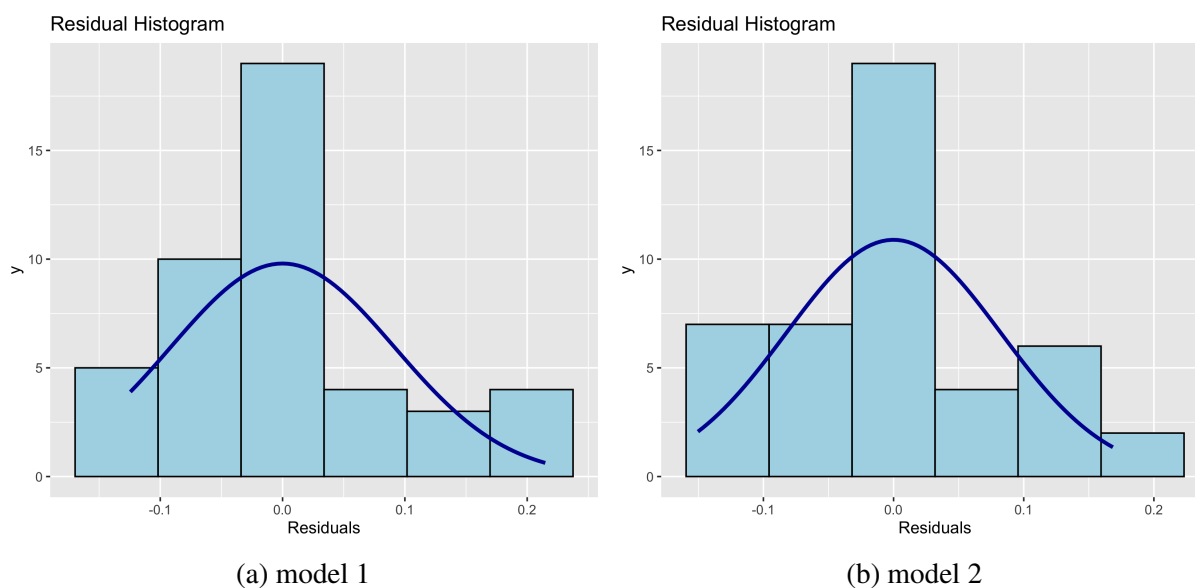
Figure 20 – Residual vs Fitted Plot

(a) model 1

(b) model 2
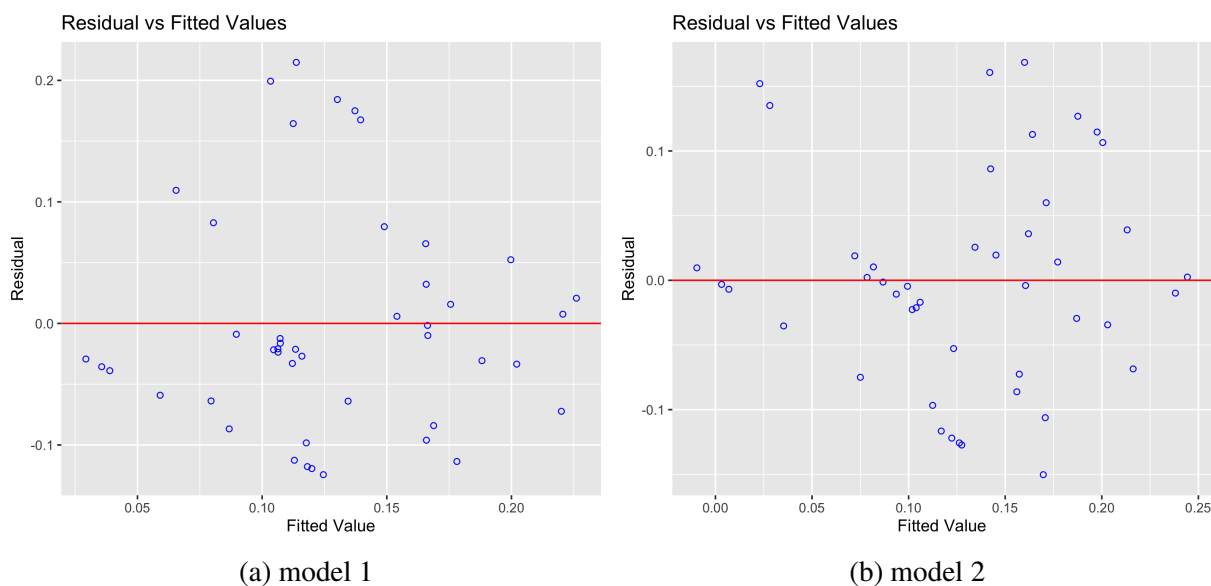
Interestingly, visual inspection is telling me residuals are normally distributed, which is not indicative of auto-correlation. This result is more clear when represented in a plot of residual vs fitted values. When the assumption of homoscedasticity (independence of residuals) is broken, we normally see some sort of pattern of placement of the values along the fitted line. However, Figure 20 shows a well-behaved plot, with random placement of values along the fitted line, for both models.

Table 28 – Heteroscedasticity tests

Test	Model 1	p-value	Model 2	p-value
Goldfeld-Quandt	3.6447	0.00519	1.5659	0.1804
Breusch-Pagan	19.696	0.0005734	15.702	0.003446
White	33.114	6.447e-08	15.277	0.0004817

Table 29 – Normality of errors tests

Test	Statistic - model 1	pvalue - model 1	Statistic - model 2	p-value - model2
Shapiro-Wilk	0.9057	0.0014	0.9596	0.1180
Kolmogorov-Smirnov	0.1611	0.1731	0.1176	0.5243
Cramer-von Mises	12.4123	0.0000	12.6978	0.0000
Anderson-Darling	1.4593	8e-04	0.6357	0.0914

Lastly, I would like to confirm what I'm seeing in a formal way, through normality of errors tests and heteroscedasticity tests, from Table 29 and Table 28, respectively. Formal tests are not really consistent on that front. Most of them reject the null hypothesis of there being homoscedasticity, but many normality tests fail to reject the null hypothesis of normality.

B. Appendix - Miscellaneous Regression Tables

Table 30 – OLS bivariate models with Heteroscedasticity-robust standard-errors

| Dependent Variable: | emphasis on prevention | | | | |
Model:	(1)	(2)	(3)	(4)	(5)
Variables					
Constant	0.0870***	0.1071***	0.0734**	0.1415***	0.3249***
	(0.0198)	(0.0276)	(0.0307)	(0.0198)	(0.0545)
PolPol	0.0600				
	(0.0452)				
PolVot		0.0120			
		(0.0534)			
gov_schemes			0.0023**		
			(0.0010)		
insur_schemes				-0.0007	
				(0.0008)	
taxd					-0.2250***
					(0.0727)
Fit statistics					
Observations	60	60	55	55	45
R^2	0.01952	0.00054	0.11134	0.02615	0.08934
Adjusted R^2	0.00261	-0.01669	0.09458	0.00777	0.06816

Heteroscedasticity-robust standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Table 31 – OLS bivariate models with clustered standard-errors

Dependent Variable:	emphasis on prevention				
Model:	(1)	(2)	(3)	(4)	(5)
Variables					
Constant	0.0870	0.1071*	0.0734	0.1415**	0.3249**
	(0.0466)	(0.0494)	(0.0784)	(0.0533)	(0.0961)
PolPol	0.0600				
	(0.1118)				
PolVot		0.0120			
		(0.1040)			
gov_schemes			0.0023		
			(0.0025)		
insur_schemes				-0.0007	
				(0.0019)	
taxd					-0.2250
					(0.1504)
Fit statistics					
Observations	60	60	55	55	45
R^2	0.01952	0.00054	0.11134	0.02615	0.08934
Adjusted R^2	0.00261	-0.01669	0.09458	0.00777	0.06816

Clustered (country) standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Table 32 – Robustness Test: OLS bivariates with standard errors

Dependent Variable:			emphasis		
Model:	(1)	(2)	(3)	(4)	(5)
Variables					
Constant	0.1330***	0.0945*	0.0949***	0.0909**	0.1958***
	(0.0310)	(0.0550)	(0.0199)	(0.0358)	(0.0700)
volatility	-0.0010				
	(0.0014)				
n_minister		0.0010			
		(0.0028)			
n_party			0.0053		
			(0.0047)		
committee				0.0113	
				(0.0173)	
confidence					-0.0026
					(0.0022)
Fit statistics					
Observations	60	60	60	60	60
R^2	0.00854	0.00203	0.02184	0.00732	0.02432
Adjusted R^2	-0.00855	-0.01517	0.00498	-0.00980	0.00750

IID standard-errors in parentheses
Signif. Codes: ***: 0.01, **: 0.05, *: 0.1

Table 33 – Robustness Test: OLS bivariates with clustered errors

Dependent Variable:			emphasis		
Model:	(1)	(2)	(3)	(4)	(5)
Variables					
Constant	0.1330**	0.0945	0.0949*	0.0909	0.1958*
	(0.0527)	(0.1118)	(0.0417)	(0.0657)	(0.0853)
volatility	-0.0010				
	(0.0017)				
n_minister		0.0010			
		(0.0064)			
n_party			0.0053		
			(0.0088)		
committee				0.0113	
				(0.0414)	
confidence					-0.0026
					(0.0023)
Fit statistics					
Observations	60	60	60	60	60
R^2	0.00854	0.00203	0.02184	0.00732	0.02432
Adjusted R^2	-0.00855	-0.01517	0.00498	-0.00980	0.00750

Clustered (country) standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Table 34 – Robustness Test: OLS multivariates for index dimensions with hetero-robust errors

| Dependent Variable: | | emphasis | |
Model:	(1)	(2)	(3)
Variables			
Constant	0.2692***	0.1201**	0.2415***
	(0.0630)	(0.0498)	(0.0858)
volatility	-0.0019**		-0.0015
	(0.0009)		(0.0015)
confidence	-0.0037**		-0.0032
	(0.0017)		(0.0024)
n_minister		-0.0022	-0.0007
		(0.0030)	(0.0039)
n_party		0.0070	0.0032
		(0.0060)	(0.0076)
committee		0.0064	0.0032
		(0.0157)	(0.0236)
Fit statistics			
Observations	60	60	60
R^2	0.05086	0.02787	0.05608
Adjusted R^2	0.01756	-0.02421	-0.03132

Heteroskedasticity-robust standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Table 35 – Robustness Test: OLS multivariates for index dimensions with clustered errors

Dependent Variable:		emphasis	
Model:	(1)	(2)	(3)
Variables			
Constant	0.2692**	0.1201	0.2415
	(0.0828)	(0.1074)	(0.1589)
volatility	-0.0019		-0.0015
	(0.0014)		(0.0017)
confidence	-0.0037		-0.0032
	(0.0020)		(0.0040)
n_minister		-0.0022	-0.0007
		(0.0051)	(0.0064)
n_party		0.0070	0.0032
		(0.0109)	(0.0129)
committee		0.0064	0.0032
		(0.0404)	(0.0529)
Fit statistics			
Observations	60	60	60
R^2	0.05086	0.02787	0.05608
Adjusted R^2	0.01756	-0.02421	-0.03132

Clustered (country) standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Table 36 – Robustness Test: OLS multivariates + controls with hetero-robust errors

Dependent Variable:			emphasis		
Model:	(1)	(2)	(3)	(4)	(5)
Variables					
Constant	0.2889***	0.1822*	0.8430***	0.1277	0.7845***
	(0.0815)	(0.0967)	(0.1444)	(0.2628)	(0.2335)
volatility	-0.0033*	-0.0012	-0.0011	-0.0032	-0.0024
	(0.0019)	(0.0021)	(0.0024)	(0.0023)	(0.0020)
confidence	-0.0041*	-0.0046*	-0.0032	-0.0022	-0.0053*
	(0.0022)	(0.0023)	(0.0027)	(0.0022)	(0.0029)
n_minister	0.0092	0.0049	-0.0020	0.0074	-0.0085
	(0.0057)	(0.0058)	(0.0075)	(0.0067)	(0.0069)
n_party	-0.0031	-0.0100	-0.0154*	-0.0084	-0.0137
	(0.0074)	(0.0074)	(0.0080)	(0.0054)	(0.0082)
committee	-0.0657	-0.0035	-0.0186	0.0914	0.0189
	(0.0444)	(0.0450)	(0.0489)	(0.0554)	(0.0381)
insur_schemes	-0.0001				
	(0.0009)				
gov_schemes		0.0027**			
		(0.0011)			
taxd			-0.5234***	0.2335	-0.3848*
			(0.1484)	(0.2509)	(0.2064)
icrg_qog				-0.7766***	
				(0.2002)	
ideologyLeft					0.1520***
					(0.0317)
ideologyRight					0.0392*
					(0.0220)
Fit statistics					
Observations	55	55	45	45	40
R^2	0.10073	0.17247	0.22212	0.49367	0.50598
Adjusted R^2	-0.01168	0.06902	0.09929	0.39788	0.37849

Heteroskedasticity-robust standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Table 37 – Robustness Test: OLS multivariates + controls with clustered errors

Dependent Variable:			emphasis		
Model:	(1)	(2)	(3)	(4)	(5)
Variables					
Constant	0.2889*	0.1822	0.8430**	0.1277	0.7845*
	(0.1313)	(0.1491)	(0.2681)	(0.1192)	(0.3254)
volatility	-0.0033*	-0.0012	-0.0011	-0.0032	-0.0024
	(0.0013)	(0.0011)	(0.0017)	(0.0020)	(0.0018)
confidence	-0.0041	-0.0046	-0.0032	-0.0022	-0.0053
	(0.0034)	(0.0042)	(0.0045)	(0.0031)	(0.0029)
n_minister	0.0092	0.0049	-0.0020	0.0074	-0.0085
	(0.0063)	(0.0057)	(0.0064)	(0.0051)	(0.0122)
n_party	-0.0031	-0.0100	-0.0154	-0.0084	-0.0137
	(0.0083)	(0.0115)	(0.0134)	(0.0071)	(0.0099)
committee	-0.0657	-0.0035	-0.0186	0.0914	0.0189
	(0.0383)	(0.0384)	(0.0678)	(0.0829)	(0.0709)
insur_schemes	-0.0001				
	(0.0017)				
gov_schemes		0.0027			
		(0.0021)			
taxd			-0.5234*	0.2335	-0.3848
			(0.2164)	(0.1896)	(0.2054)
icrg_qog				-0.7766**	
				(0.2479)	
ideologyLeft					0.1520**
					(0.0539)
ideologyRight					0.0392*
					(0.0166)
Fit statistics					
Observations	55	55	45	45	40
R^2	0.10073	0.17247	0.22212	0.49367	0.50598
Adjusted R^2	-0.01168	0.06902	0.09929	0.39788	0.37849

Clustered (country) standard-errors in parentheses
Signif. Codes: ***: 0.01, **: 0.05, *: 0.1

Table 38 – OLS lagged models with standard errors (15 years)

Dependent Variable:	emphasis on prevention					
Model:	(1)	(2)	(3)	(4)	(5)	(6)
Variables						
Constant	1.011***	1.070***	1.079***	0.9957**	0.8259	1.255**
	(0.2070)	(0.2231)	(0.2094)	(0.3986)	(0.5437)	(0.4722)
lag15_PolPol	-0.4454***	-0.4136***	-0.5150***	-0.3678**	-0.3943**	-0.4577***
	(0.1402)	(0.1474)	(0.1435)	(0.1466)	(0.1587)	(0.1511)
lag15_PolVot	-0.1937*	-0.1143	-0.0869	-0.1268	-0.1697	-0.0532
	(0.1044)	(0.1497)	(0.1102)	(0.1276)	(0.1585)	(0.1244)
lag10_insurscheme	0.0027**	0.0034**	0.0029**			
	(0.0011)	(0.0014)	(0.0011)			
taxd	-0.8165***	-0.8459***	-1.006***	-0.7212**	-0.6162	-1.068**
	(0.2038)	(0.2088)	(0.2257)	(0.3279)	(0.4009)	(0.4206)
lag15_qog		-0.2030			0.1553	
		(0.2732)			(0.3341)	
lag15_ideologyLeft			0.0310			0.0342
			(0.0548)			(0.0642)
lag15_ideologyRight			0.1067**			0.1156**
			(0.0448)			(0.0478)
lag10_govscheme				-0.0028	-0.0012	-0.0045
				(0.0030)	(0.0046)	(0.0035)
Fit statistics						
Observations	43	43	43	43	43	43
R^2	0.33098	0.34081	0.43465	0.23933	0.24375	0.35414
Adjusted R^2	0.26055	0.25173	0.34042	0.15926	0.14155	0.24650

IID standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Table 39 – OLS lagged models with Heteroscedasticity-robust standard-errors (15 years)

Dependent Variable:			emphasis on prevention			
Model:	(1)	(2)	(3)	(4)	(5)	(6)
Variables						
Constant	1.011***	1.070***	1.079***	0.9957***	0.8259*	1.255***
	(0.1853)	(0.2226)	(0.2000)	(0.3445)	(0.4251)	(0.4560)
lag15_PolPol	-0.4454***	-0.4136***	-0.5150***	-0.3678***	-0.3943***	-0.4577***
	(0.1213)	(0.1148)	(0.1177)	(0.1161)	(0.1245)	(0.1289)
lag15_PolVot	-0.1937	-0.1143	-0.0869	-0.1268	-0.1697	-0.0532
	(0.1210)	(0.1469)	(0.1346)	(0.1201)	(0.1354)	(0.1335)
lag10_insurscheme	0.0027*	0.0034*	0.0029*			
	(0.0014)	(0.0019)	(0.0016)			
taxd	-0.8165***	-0.8459***	-1.006***	-0.7212***	-0.6162*	-1.068**
	(0.1797)	(0.1962)	(0.2317)	(0.2629)	(0.3063)	(0.4250)
lag15_qog		-0.2030			0.1553	
		(0.2491)			(0.2255)	
lag15_ideologyLeft			0.0310			0.0342
			(0.0513)			(0.0689)
lag15_ideologyRight			0.1067***			0.1156***
			(0.0261)			(0.0305)
lag10_govscheme				-0.0028	-0.0012	-0.0045
				(0.0030)	(0.0038)	(0.0036)
Fit statistics						
Observations	43	43	43	43	43	43
R^2	0.33098	0.34081	0.43465	0.23933	0.24375	0.35414
Adjusted R^2	0.26055	0.25173	0.34042	0.15926	0.14155	0.24650

Heteroscedasticity-robust standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Table 40 – OLS lagged models with clustered standard-errors (15 years)

Dependent Variable:	emphasis on prevention					
Model:	(1)	(2)	(3)	(4)	(5)	(6)
Variables						
Constant	1.011*	1.070**	1.079**	0.9957	0.8259	1.255**
	(0.3673)	(0.3706)	(0.2729)	(0.6339)	(0.5569)	(0.3207)
lag15_PolPol	-0.4454	-0.4136	-0.5150*	-0.3678	-0.3943	-0.4577
	(0.2971)	(0.2833)	(0.2273)	(0.2593)	(0.2765)	(0.2318)
lag15_PolVot	-0.1937	-0.1143	-0.0869	-0.1268	-0.1697	-0.0532
	(0.1189)	(0.1741)	(0.0781)	(0.0945)	(0.1409)	(0.0804)
lag10_insurscheme	0.0027	0.0034	0.0029**			
	(0.0017)	(0.0019)	(0.0007)			
taxd	-0.8165*	-0.8459*	-1.006**	-0.7212	-0.6162	-1.068**
	(0.3380)	(0.3246)	(0.2602)	(0.5039)	(0.4536)	(0.2684)
lag15_qog		-0.2030			0.1553	
		(0.3614)			(0.2313)	
lag15_ideologyLeft			0.0310			0.0342
			(0.0914)			(0.0998)
lag15_ideologyRight			0.1067***			0.1156**
			(0.0134)			(0.0269)
lag10_govscheme				-0.0028	-0.0012	-0.0045**
				(0.0054)	(0.0049)	(0.0014)
Fit statistics						
Observations	43	43	43	43	43	43
R^2	0.33098	0.34081	0.43465	0.23933	0.24375	0.35414
Adjusted R^2	0.26055	0.25173	0.34042	0.15926	0.14155	0.24650

Clustered (country) standard-errors in parentheses
Signif. Codes: ***: 0.01, **: 0.05, *: 0.1

C. Appendix - Interview Guide

INTERVIEW GUIDE (Portuguese version)

BLOCO I - Identificação

1. Nome/função

2. Trajetória: Há quanto tempo trabalha no mesmo cargo/onde trabalhava antes

BLOCO II - a) Estrutura e processo decisório interno

1. Qual o papel do seu departamento no planejamento/política ou pesquisa ou financiamento em dengue? a) Qual o seu papel individual dentro desse processo? b) Qual contato você tem com outros atores nesse processo?

2. Quais outros departamentos e ministérios estão envolvidos nesse processo? a) Como eles estão envolvidos e em quais etapas? Qual o papel deles? b) Quais são os passos chave nesse processo? c) Quais são os atores chave nesse processo?

3. O que você define como priorização e direcionamento na dengue?

4. Você acha que as decisões sobre priorização e direcionamento das intervenções para o controle da dengue são tomadas dentro da Secretaria de Saúde?

5. Em caso afirmativo, as decisões sobre priorização e direcionamento são feitas com base em que tipo de dados? (por exemplo, tendo um orçamento limitado, como a SS decide qual intervenção e modalidade de entrega a intervenção priorizar? Ou como a SS decide quais áreas ou populações precisam ser atingidas?)

6. É possível saber os gastos com o controle da dengue por ano? É possível por tipo de intervenção e área geográfica? Como você prioriza onde e em que investir dinheiro?

7. Esses processos internos sempre foram feitos dessa forma? Se não, quais mudanças foram feitas no seu conhecimento e quando? Sabe dizer por que mudaram?

8. Mudanças de gestão/pessoal fazem muita diferença na condução na política?

BLOCO II - b) Fora do órgão (nível nacional/estadual/municipal)

1. Quais são as principais organizações com autoridade para tomar decisões sobre Dengue em nível nacional/estadual?

2. Pode descrever os mecanismos de colaboração entre a SS e os Distrito Sanitários?

3. Quais são os órgãos/escritórios oficiais que coletam, sintetizam e fornecem evidências para informar os principais escritórios da SS?

4. Fora da SS existem alguns atores mais influentes do que outros no processo de política/planejamento?

5. Mudanças de gestão/pessoal a nível nacional/estadual fazem muita diferença na condução da política?

BLOCO III - Produção, acesso e uso de dados

1. Quais decisões você precisa tomar em sua função para as quais precisa de dados?

2. Os dados de que você precisa geralmente estão disponíveis para você?

3. O que está disponível? O que não está disponível?

4. Quais são os pontos fortes e as limitações de cada fonte de dados que você está usando?

5. Que tipo de dados você (pessoalmente) e sua organização estão usando para o controle da dengue? Se algum, quais dados para priorização e direcionamento de intervenções?

6. Quais são as principais fontes das quais você acessa os dados que usa em sua função atual? (Tente obter informações em pelo menos 3 fontes)

7. Existem órgãos oficiais encarregados de revisão/síntese de evidências dentro ou fora da SS?

8. Quais são os principais canais pelos quais ocorre a transferência de conhecimento sobre a Dengue dos dados/pesquisa para a SS e para o seu departamento)?

9. Como esses mecanismos podem ser melhorados?

10. Você acha que evidências/dados poderiam ser usados de forma mais eficaz?

11. Em que medida as recomendações da OMS são utilizadas no planejamento e controle da Dengue?

12. Existem regulamentos que você segue sobre priorização e direcionamento?

13. Na sua opinião, quais são as principais lacunas de conhecimento sobre a produção e uso de dados para o controle da dengue em nível nacional dentro da SS? (por exemplo, ter dados de rotina robustos ou pesquisa robusta, especifique...)

14. Quem são os principais interessados na pesquisa da dengue no país?

15. Como a pesquisa é usada para priorização e direcionamento?

BLOCO IV - Informação adicional

1. Há mais alguma coisa que você acha importante que eu saiba?

2. Há algo que eu perdi?

3. Há algum documento que você possa recomendar que possa ser interessante para este estudo?

4. Com quem mais seria bom conversar sobre isso?

5. Você tem alguma pergunta para mim?

INTERVIEW GUIDE (English version)

I - Background to interviewee

1. Could you tell me your name and your current role?

2. How long have you been working in the same position? / Where have you been working before?

II - a) Internal Decision making process and structure

1. What is the role of your Department in the planning/policy OR research OR financing in dengue? a) What is your particular (individual) role within the process? b) What contact do you have with other actors in the process?

2. Which other departments and Ministries are involved in this process? a) How are they involved and at what stage?/ Which role? b) What are the key steps in this process? c) Who are the key actors in this process?

3. What do you define as prioritisation and targeting in dengue?

4. Do you think that decisions on prioritisation and targeting of interventions for dengue control are taken within the HS?

5. If yes, decisions on prioritisation and targeting are made on the base of which type of data? (e.g. Having a limited budget, how the HS decide which intervention and modality of delivery the intervention to prioritise? Having a limited budget, how the HS decide which areas or populations need to be targeted?)

6. It is possible to know the expenditure for dengue control by each year? It is possible by type of intervention and geographical area? How do you prioritise where and in what to invest money?

7. Were this internal processes always done this way? If not, which changes were made in your knowledgem and when? Do you know why they were changed?

8. Changes in management/personnel make a big difference in conducting the policy?

II - b) Outside the agency (national/state/municipal level)

1. What are the key organisations with authority to make decisions on Dengue at national/state level?

2. Can you describe the mechanisms of collaboration between the HS and the Sanitary Districts?

3. What are the official agencies/offices that gather, synthesise, and provide evidence to inform key office in the HS?

4. Outside the HS there are some actors more influential than others in the policy/planning process?

5. Changes in management/personnel at the national/state level make a big difference in conducting the policy?

III - Production & access of data

1. What decisions do you have to make in your role for which you need data?

2. Is the data that you need generally available to you?

3. What is available? What isn't available?

4. What are the strength and limitation of each source of data you are using?

5. Which type of data are you (personally) and your organisation using for dengue control? In any, which data for prioritisation and targeting interventions?

6. What are the main sources from which you access data that you use in your current role? (Try to get information on at least 3 sources)

7. Are there any official bodies tasked with evidence review/synthesis inside or outside the HS?

8. What are the main channels through which Dengue knowledge transfer occurs (from the data/ research to the HS and to your department) ?

9. How could these mechanisms be improved?

10. Do you think evidence/data could be used more effectively?

11. To what extent the WHO recommendations are utilised in Dengue planning and control?

12. Are regulations that you are following on prioritisation and targeting?

13. In your opinion, which are the main knowledge gaps on the production and use of data for dengue control at national level inside the HS? (e.g. having robust routine data or robust survey, specify. . . .)

14. Who are the main stakeholders on dengue research in the country?

15. How research is used for prioritisation and targeting?

IV - Additional information

1. Is there anything else you think is important for me to know?

2. Is there anything I have missed out?

3. Are there any documents you could recommend that might be interesting to this study?

4. Who else would be good to talk to about this?

5. Do you have any questions for me?

D. Appendix - Document Overview

Table 41 – Overview of the consulted policy documents (continues)

Year	Policy Document
Legislation	
1975	Law No. 6.259 - About organisation of the Epidemiological Surveillance actions
1990	Law No. 8.080 - About conditions to promotion, protection and recovery of health
1990	Law No. 8.142 - About managing and financing the National Health System (SUS)
2006	Law No. 11.350 - About activities of the Endemics Control Agents
2009	Ordinance No. 3.252 - About guidelines for execution and financing of Health Surveillance by Federal, State and Municipal spheres
2010	Ordinance No. 2.472 - About health terminologies used in the legislation
2011	Decree No. 7.508 - Regulates the Law 8.080 (1990)
2013	Ordinance No. 1.378 - Regulates responsibilities and guidelines for execution and financing of Health Surveillance by Federal, State and Municipal spheres
2015	Decree No. 8.474 - Regulates the Law 11.350 (2006)
2015	Ordinance No. 1.955 - Alters and adds to the Ordinance 1.378
2018	Law No. 13.595 - Alters the Law 11.350 (2006)
National Guidelines	
1986	Epidemiological Surveillance Guide (1st edition)
1986	Bibliographic Summary of Endemics Control in Brazil (1979 to 1984)
1996	Aedes Aegypti Eradication Master Plan
2002	National Program of Dengue Control
2005	Epidemiological Surveillance Guide
2009	National Guidelines for Dengue Epidemics Prevention and Control
2009	Guide to Local Management of Malaria Control
2009	Epidemiological Surveillance Guide
2010	National Guidelines for Health Surveillance

Table 42 – Overview of policy documents (continuation)

Year	Policy Document
2014	Unified Health Surveillance Guide
2014	National Contingency Plan for Chikungunya Fever
2016	Unified Health Surveillance Guide
2017	Unified Health Surveillance Guide
2019	Unified Health Surveillance Guide
2022	Contingency Plan for Response to Public Health Emergencies in Dengue, Chikungunya and Zika
Local guidelines	
2005	State Plan for Health
2008	State Plan for Health
2012	State Plan for Health
2013	State Guide for Managing Health Surveillance
2016	State Plan for Health
2020	State Plan for Health
2010	Municipal Plan for Health
2015	Municipal Plan for Health
2018	Municipal Plan for Health
Technical manuals	
1978	Instructions for Guards and Chief-Guards - Fight Against Aedes Aegypti
1985	Fight Against Aedes Aegypti - Instructions to Guards, Chief-Guards and Inspectors
2001	Dengue - Instructions for Vector Fight Staff - Manual of Technical Norms
2013	Quick survey of indexes for Aedes Aegypti - LIRAa - for entomological surveillance of Aedes Aegypti in Brazil
2019	Manual on Health Protection Measures for Agents to Combat Endemic Diseases

Source: Author's elaboration (2023)

Figure 21 – Resources Table from PNCD (2002)

Anexo 4 - Necessidades de recursos orçamentários por componentes

Valores em R$ 1.000

ÓRGÃO	NATUREZA DA DESPESA	RECURSOS ATUAIS [1]	RECURSOS ADICIONAIS											RECURSOS TOTAIS
			Vigilância epidemiológica [2]	Combate ao vetor [3]	Integração com PACS/PSF [4]	Saneamento ambiental [5]	Educação em saúde, comunicação e mobilização social [6]	Capacitação de Recursos Humanos [7]	Legislação [8]	Sustentação política [9]	Acompanhamento e avaliação [10]	Reserva Técnica [11]	SUBTOTAL	
FUNASA	Pessoal	205.400,16											-	205.400,16
	Custeio	77.195,80	1.770,00			68.000,00	400,00	9.153,10	150,00	200,00	389,00	7.255,10	87.317,20	164.513,00
	Capital		2.225,51	29.568,40		5.900,00					817,00	1.644,10	40.155,01	40.155,01
	Subtotal	282.595,96	3.995,51	29.568,40	-	73.900,00	400,00	9.153,10	150,00	200,00	1.206,00	8.899,20	127.472,21	410.068,17
MINISTÉRIO DA SAÚDE	Pessoal				39.956,88								39.956,88	39.956,88
	Custeio						25.000,00						25.000,00	25.000,00
	Subtotal	-	-	-	39.956,88	-	25.000,00	-	-	-	-	-	64.956,88	64.956,88
MINISTÉRIO DA SAÚDE TFECD (*)	Pessoal	272.383,20		55.000,00									55.000,00	327.383,20
	Custeio	95.686,65										5.000,00	5.000,00	100.686,65
	Subtotal	368.069,85	-	55.000,00	-	-	-	-	-	-	-	5.000,00	60.000,00	428.069,85
SMS e SES TFECD	Pessoal	79.710,73		16.850,17									16.850,17	96.560,90
	Custeio	34.161,74											-	34.161,74
	Subtotal	113.872,48	-	16.850,17	-	-	-	-	-	-	-	-	16.850,17	130.722,65
TODOS	Pessoal	557.494,09	-	71.850,17	39.956,88	-	-	-	-	-	-	-	111.807,05	669.301,14
	Custeio	207.044,19	1.770,00	-	-	68.000,00	25.400,00	9.153,10	150,00	200,00	389,00	12.255,10	117.317,20	324.361,39
	Capital	-	2.225,51	29.568,40		5.900,00					817,00	1.644,10	40.155,01	40.155,01
	TOTAL	764.538,29	3.995,51	101.418,57	39.956,88	73.900,00	25.400,00	9.153,10	150,00	200,00	1.206,00	13.899,20	269.279,26	1.033.817,55

Source: Programa Nacional de Controle da Dengue

Figure 22 – Resources Table from PEAa (1996)

QUADRO 5

ESTIMATIVA DE CUSTOS, POR ELEMENTO DE DESPESA, PARA O PLANO OPERATIVO DE ERRADICACAO DO *AEDES AEGYPTI* NO BRASIL PARA OS ANOS DE 1996 A 1998

R$ 1,00

ELEMENTOS DE DESPESA	CUSTOS (R$)			TOTAL
	1996 (*)	1997	1998 (**)	
1. PESSOAL				
. Salario	333.088.140	142.752.060	142.752.060	618.592.260
. Diarias	1.083.600	928.800	928.800	2.941.200
. Indenizacoes	87.040.000	65.280.000	65.280.000	217.600.000
. Encargos	166.544.070	71.376.030	71.376.030	309.296.130
SUB TOTAL	587.755.810	280.336.890	280.336.890	1.148.429.590 79,19%
2. MAT. CONSUMO (***)				
. Larvicida	14.976.000	24.081.600	-	39.057.600
. Adulticida CE (UBV)	32.256.000	32.256.000	-	64.512.000
. Adulticida PM	1.996.800	3.194.880	-	5.191.680
. Oleo de Soja	376.320	376.320	-	752.640
. Combustivel	16.755.000	5.289.000	5.289.000	27.333.000
. Bolsa de Lona	1.165.100	374.740	374.740	1.914.580
. Uniforme	7.849.080	2.477.640	2.477.640	12.804.360
. Outros	450.709	6.590.274	3.227.869	10.268.852
SUB TOTAL	75.825.009	74.640.454	11.369.249	161.834.712 11,16%
3. EQUIP.MATER.PERMANENTE				
. Equip. UBV HD	1.389.000	-	-	1.389.000
. Equip. UBV Port.	6.400.000	-	-	6.400.000
. Pulver. Costal	85.300	-	-	85.300
. Pick up	117.460.000	-	-	117.460.000
. Caminhao	1.320.000	-	-	1.320.000
. Moto	2.054.000	-	-	2.054.000
. Bicicleta	244.800	-	-	244.800
. Microscopio	1.015.000	-	-	1.015.000
. Outros	1.300.000	-	-	1.300.000
SUB TOTAL	131.268.100		0	131.268.100 9,05%
4. SERVIÇOS DE TERCEIROS E ENCARGOS (****)	6.212.793	2.432.643	-	8.645.437 0,60%
TOTAL	801.061.712	363.857.642	291.706.139	1.450.177.839 100,00%

(*) - Esta incluido o valor de R$ 93.290.830,00, referente a despesas com pessoal para 1996
(**) - Foi estimado para 1998, 50% do contingente de pessoal inicialmente admitido
(***) - Inclui 50% da compra de insumos necessarios para 1997
(****) - Inclui Recursos de Treinamento de Pessoal

Source: Plano Diretor de Erradicação do Aedes Aegypti do Brasil

B. Annex - Newspapers

Figure 23 – Newspaper page about the failure of PEAa - part 1

Figure 24 – Newspaper page about the failure of PEAa - part 2

SAÚDE *Estudo avalia o desempenho geral dos Estados e ignora as deficiências que geram surtos em municípios isolados*

Funasa não detecta problemas localizados

DA SUCURSAL DE BRASÍLIA

Mesmo os Estados bem avaliados pela Funasa podem apresentar deficiências graves no controle de epidemias. "A avaliação geral de um Estado pode esconder problemas localizados em alguns municípios", diz Mauro Ricardo Costa, presidente da Funasa.

Isso acontece porque a maioria das ações de combate às doenças endêmicas é realizada pelos mu-

nicípios, cabendo aos Estados apenas monitorar essas ações.

O combate aos focos de dengue, por exemplo, é atribuição municipal —mesmo quando é feito com recursos federais. Nessa situação, cabe ao Estado fiscalizar.

São Paulo é o quarto Estado mais bem avaliado, mas enfrenta surtos de dengue em várias regiões. O pior deles, em Barretos, confirma a necessidade de fiscalização, Auditoria do Ministério da

Saúde descobriu que os recursos repassados para combater a doença não foram usados como o previsto. Em todo o ano passado, não houve trabalho preventivo para eliminar focos do mosquito. O resultado apareceu neste ano.

Segundo o estudo da Funasa, as duas melhores vigilâncias epidemiológicas estão no Rio Grande do Sul e Santa Catarina. As duas piores ficam no Acre e Amazonas.

O que difere as melhores das

piores é, principalmente, a constância. Entre os 13 indicadores avaliados pela Funasa, o Rio Grande do Sul aparece com problemas apenas no tratamento da raiva humana, Santa Catarina, no controle de meningite.

O Acre, ao contrário, teve apenas três áreas bem avaliadas. Amazonas aparece com quatro boas avaliações.

Em todo o país, uma das áreas mais problemáticas apontadas

pelo estudo é o sistema de informação de mortalidade. "É essencial termos informações precisas para podermos estabelecer as políticas públicas. Por isso estamos cobrando", diz Costa.

As deficiências no sistema de informação de mortalidade comprometem a confiabilidade no índice de mortalidade infantil. O número usado hoje, de 36 mortes por mil nascidos vivos, é uma estimativa feita pelo IBGE.

Outra área problemática em quase todo o país é o de controle de meningite. Apenas Roraima, Rio Grande do Sul e Sergipe conseguiram boa avaliação. A falta de ações se reflete nos números. O país teve mais de 4.000 casos de meningite em 99. Em 2000, foram 3.500 —menor, mas ainda alto.

"Em 2000, muitos Estados já melhoraram seu desempenho. Imagino que isso vá aparecer na próxima avaliação", diz Costa.

Fundação quer avaliação anual

DA SUCURSAL DE BRASÍLIA

A avaliação das vigilâncias epidemiológicas estaduais, a ser realizada uma vez por ano, vai servir para que a Funasa cobre ações dos governos. "Poderemos orientar os Estados nas áreas deficientes", afirma Mauro Ricardo Costa, presidente da Funasa.

Os relatórios já foram entregues aos secretários estaduais da Saúde e aos governadores.

O estudo avaliou 13 indicadores relacionados aos sistemas de informações de doenças, mortalidade e nascimentos, à vigilância epidemiológica (como controle de sarampo e meningite) e ao controle de doenças evitáveis (vacinação e a erradicação do *Aedes aegypti*, por exemplo).

Para cada quesito, foi observado se o Estado estava acima ou abaixo das metas estabelecidas e da média nacional. Depois, foi dado peso maior para as áreas consideradas mais importantes.

Foi o que aconteceu com o sistema de notificação de doenças e a erradicação do sarampo. O Ministério da Saúde precisa das notificações para definir suas políticas e do segundo item porque é meta do governo federal erradicar o sarampo até o ano que vem.

Os Estados mais bem avaliados conseguiram conceito bom na maior parte das áreas, mas ainda têm algumas falhas.

O estudo usou dados de 99 e só foi finalizado em 2000. O resultado demorou a sair porque era a primeira vez que se fazia tal avaliação. A partir deste ano, no entanto, a avaliação será anual. O objetivo é ver quem está evoluindo e quem ficou para trás.

A partir daí se poderá ver quem está evoluindo e quem ficou para trás. "Vigilância é uma questão de decisão política. Muitos governantes ainda não assimilaram isso", diz o presidente da Funasa. "É muito mais fácil ficar atrás do balcão esperando o doente chegar que tentar prevenir."

AS NOTAS DOS ESTADOS

Especialistas culpam municipalização

KÁTIA STRINGUETO
DA REPORTAGEM LOCAL

A falta de controle na prevenção de endemias e as falhas no processo de municipalização da saúde são responsáveis pelo ressurgimento da dengue e de outras doenças tropicais no país.

Essa é a opinião de quatro especialistas ouvidos pela Folha. Entre as causas do aumento dos casos de dengue registrados no país nos últimos dez anos estaria a descentralização do sistema de controle de endemias.

Em São Paulo, o controle era estadual e passou para a esfera municipal. No restante do país, o controle migrou do Ministério da Saúde para as prefeituras.

O problema é que o controle de mosquitos, como o *Aedes aegypti*, é complicado. Segundo Paulo Elias, do departamento de medicina preventiva da USP (Universidade de São Paulo), para que os municípios possam cumprir esse encargo é preciso dispor de estrutura, o que nem sempre ocorre.

Elias diz que seria necessário supervisionar o trabalho dos municípios para assegurar que todos estivessem executando adequadamente a prevenção.

Basta que uma prefeitura deixe de fazer a sua parte para colocar em risco toda a sua região, já que o curso do mosquito não respeita fronteiras administrativas. "Não é tudo que dá para descentralizar."

A professora de epidemiologia da Santa Casa de São Paulo Rita Barradas Barata, ex-presidente da Associação de Saúde Coletiva, diz

que a prevenção poderia ser municipal, desde que a gestão do programa fosse estadual.

O motivo, diz ela, é a complexidade da ação. São necessários peritos para a pulverização dos focos de mosquito e um planejamento adequado.

Os casos de dengue autóctone em São Paulo são um indício de que a lição de casa não foi cumprida pelas últimas prefeituras. "Se não há controle do mosquito na cidade, quando aparece um único doente, rapidamente a doença se dissemina", diz Rita.

A idéia da descentralização com repasse da responsabilidade para as prefeituras não está errada, segundo os especialistas. O problema é que o serviço e a verba para combater o mosquito foram repassados aos municípios, mas o controle de qualidade, não.

"Houve uma transição atabalhoada de poder, vai levar um tempo até as prefeituras aprenderem a fazer o controle do mosquito corretamente", diz Rita.

"Sempre que se afrouxa o controle do mosquito, a doença volta", afirma o ex-ministro da Saúde Adib Jatene, autor de um plano de erradicação do mosquito que nunca saiu do papel.

Segundo o infectologista Marcos Boulos, da USP, o problema é que o país não tem política nacional para controlar esse tipo de doença. "Ele (José Serra, ministro da Saúde) pode até colocar a culpa do crescimento do mosquito nos municípios, mas o que falta mesmo é uma política nacional de controle."

Reinfecção por vírus acarreta riscos maiores

DA REPORTAGEM LOCAL

O maior risco da presença do *Aedes aegypti* num local é a facilidade com que o vírus da dengue se dissemina.

Há quatro tipos de vírus da dengue. Se uma pessoa é reinfectada por vírus diferentes, aumentam as probabilidades de ela contrair a forma mais grave da doença: a dengue hemorrágica.

O problema se agrava porque o controle dos focos do mosquito no Brasil é precário e porque o país já abriga pelo menos três tipos de vírus. Em uma infecção secundária, o risco de ter dengue hemorrágica é de 1%. (KS)

[Legal notices and advertisements follow]

Source: Acervo Folha de São Paulo (09/04/2001)

Figure 25 – Newspaper page about Measures taken for the Zika virus epidemic

A12 Metrópole | TERÇA-FEIRA, 2 DE FEVEREIRO DE 2016   O ESTADO DE S. PAULO

Dilma vai a rádio e TV para mostrar ações do governo

A presidente vai pedir a mobilização da sociedade; ela tem dito a auxiliares que está 'agoniada' porque ações demoram a sair do papel

Tânia Monteiro
Isadora Peron
Carla Araújo / BRASÍLIA

Pouco tempo depois do anúncio oficial da Organização Mundial da Saúde (OMS), a presidente Dilma Rousseff reuniu ministros para exigir o envolvimento de todos os níveis de seu governo no combate ao *Aedes aegypti*. "Quero todos envolvidos, todos os dias", avisou. Para reforçar a ideia, ela decidiu gravar um pronunciamento em cadeia nacional de rádio e TV para pedir a mobilização de toda a sociedade contra o mosquito. Em sua fala, deve também apresentar diversas ações, para mostrar que o governo "não está parado".

Após a reunião, o ministro da Casa Civil, Jaques Wagner, negou que tenha havido negligência do governo nos últimos anos no combate aos criadouros do inseto. "Não acho que dê para falar em negligência, mas em dificuldades. É uma guerra difícil, uma briga contra um inimigo quase invisível", afirmou.

Jaques Wagner também negou que haja qualquer risco de a Olimpíada do Rio, marcadas para agosto, ser cancelada. Mas reconheceu que poderá haver uma retração de público, além de recomendações para que as grávidas não se arrisquem. "Em um primeiro momento, todo mundo se assombra, se recolhe. Mas, até lá (*agosto*), esclarecimentos de órgãos como a OMS e as mobilizações terão surtido efeito", acrescentou. Ele ressaltou que as ações estão sendo feitas não por causa dos Jogos Olímpicos. "Mas por uma questão grave de saúde."

Dilma não decidiu se o seu pronunciamento irá ao ar hoje

MP permite entrada à força em casas

● Vale desde ontem a Medida Provisória 712, que autoriza o ingresso à força de agente de saúde em imóveis públicos ou particulares para combater focos do *Aedes aegypti*, no caso de situação de abandono ou de ausência de pessoa que possa permitir o acesso desse profissional. Se necessário, o agente público competente poderá requerer o auxílio à autoridade policial.

Entre medidas que podem ser executadas, a MP ainda cita as visitas tradicionais a imóveis públicos e particulares para eliminação do mosquito e de seus criadouros e a realização de campanhas educativas e de orientação.

ou amanhã. No Planalto, as avaliações são de que a fala, gravada no Palácio do Alvorada, teria de ir ao ar de imediato. A presidente tem dito aos seus auxiliares diretos que está "agoniada" porque várias das ações que têm determinado demoram a sair do papel.

Na sexta-feira, Dilma esteve na sala de acompanhamento de ações da microcefalia, onde conversou com governadores, pedindo ajuda deles para o combate ao mosquito. A maior dificuldade do governo, segundo queixas no Planalto, é de que muitas das ações dependem dos Estados e municípios que, em muitos casos, têm demorado a responder ao surto.

Wagner negou também que o pronunciamento de Dilma tenha sido idealizado pela proximidade com o carnaval, mas disse que ela pode até citar o feriado ao pedir mais atenção de brasileiros e turistas. O ex-governador da Bahia aproveitou para fazer um apelo aos artistas. "Espero que deem uma mensagem de alerta contra o mosquito no carnaval", disse, ressaltando que estava pensando na "voz" que os músicos têm nos trios elétricos de seu Estado.

'Contaminar a consciência'. Para ele, "a única forma de lutar contra o mosquito é contaminar a consciência de todos". Ao defender as ações desenvolvidas pelo governo, para combate ao mosquito, o ministro lembrou que a primeira notificação da doença foi em 22 de outubro e, em 11 de novembro, já havia sido decretado estado de emergência no País por causa da doença. Na opinião dele, houve movimentação de todas as partes. "Desconheço algum governador ou prefeito que não tenha feito campanha, que tenha negligenciado", declarou.

Jaques Wagner ainda negou que a ausência do ministro da Saúde, Marcelo Castro, naquela entrevista, seja porque ele tá desprestigiado pelo governo por causa das suas polêmicas falas. "Não há nenhum balanço nem corda bamba para o Ministro da Saúde", disse Wagner, ao afirmar que ele saiu porque tinha a gravação de um programa em São Paulo. A mesa onde Wagner deu entrevista, porém, tinha o nome de Castro.

Vacina. Para a OMS, a relação entre zika e microcefalia carece de comprovação. Mas o ministro Jaques Wagner insistiu que, para o Brasil, a relação existe e uma vacina para o zika deve demorar três anos. "Agora, a única vacina que temos é a consciência cidadã de todo mundo."

ANDRE DUSEK/ESTADÃO

Reunião ministerial. Governo nega negligência e diz que a única vacina é a ação cidadã

PERGUNTAS & RESPOSTAS

Sem restrições, só proteção

1.
Por que a OMS decidiu declarar microcefalia, e não o zika, como emergência mundial?
Para a OMS, o zika não é doença grave e seus efeitos em 75% dos casos sequer exigem hospitalização. Portanto, não haveria motivo para declarar o vírus como tal uma emergência. Como também não existe uma prova científica da relação entre o vírus e a microcefalia, a entidade optou por declarar apenas a má-formação como emergência.

2.
O que acontece agora? Quais medidas serão tomadas em relação à microcefalia? Será decretada notificação obrigatória de casos?
A notificação é obrigatória e países são forçados a informar à OMS qualquer caso que seja registrado. Também fica estabelecida a necessidade de fortalecer a pesquisa.

3.
Haverá um fundo de combate à microcefalia? Como vai funcionar? Quem vai gerir?
Sim, nos próximos dias um mecanismo de financiamento será anunciado e governos e instituições serão convidados a contribuir. A OMS vai administrar o fundo e, com o dinheiro, ajudará países a combater a doença e fazer pesquisas.

4.
O Brasil terá alguma posição de destaque nisso?
O Brasil é o centro de todas as atenções e receberá parte dos recursos para a pesquisa.

5.
Existe alguma recomendação para não viajar ao Brasil? E para grávidas?
Não. Diante da ausência de provas da ligação entre o vírus e a microcefalia. Mas recomenda-se que gestantes se protejam de mosquitos, até mesmo para evitar a dengue.