

Health Capability studies in rural Senegal

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Thesis defense

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Jury

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Introduction

Motivation

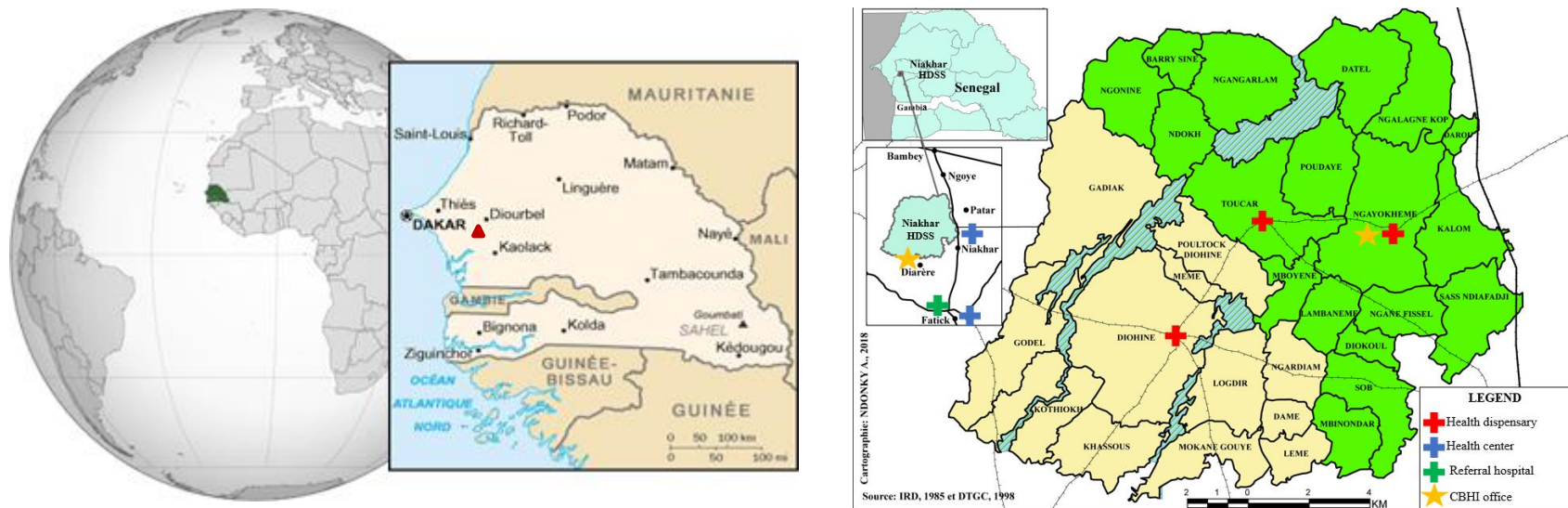
- Health economics is concerned with **health promotion**, and the regulation of healthcare markets (Mushkin, 1958)
 - Health is influenced by a variety of factors, both at the individual and societal levels (Grossman, 1982)
 - “Social Determinants of Health” should be addressed to tackle inequities in health outcomes and prospects (WHO, 2008)
- Limitations of these approaches
 - Limited **descriptive** and **explanatory** power
 - Fail to account for dynamic interactions, interdependences, and cumulative influences
 - Inadequate to address **equity** concerns
 - Assume that resources and social conditions are homogenous across socio-economic groups

Health capability

- Capability theory (Sen, 1980)
 - Agency, differential ability to turn resources into functionings
- Health capability (Prah, 1998; 2009)
 - “*Confidence and ability to be effective in achieving optimal health*” now, and in the future
 - Health functioning and health agency are essential to **flourishing**
 - Fairness, measured with respect to **shortfall inequality**, guides policy
- Conceptualization and operationalization (Prah, 2010)
 1. Health Capability **Model** defining four overlapping dimensions
 2. Health Capability **Profile** of *individual* strengths, abilities, and conditions
 - Including (barriers to) healthcare access and utilization

Empirical setting

The Niakhar Health and Demographic Surveillance System (HDSS) in rural Senegal, Sub-Saharan Africa



- Agricultural activity, frequent migrations, Sereer sining ethnicity
- “Laboratory” for research in health and social sciences
 1. **AmBASS** survey and hepatitis B screening among all residents of randomly selected households
 2. **CMUtuelles** survey evaluating the implementation of community-based health insurance (CBHI) schemes

Objectives

This dissertation seeks to develop **empirical applications** of health capability in addressing SDGs (2015-2030) in rural Senegal.

Secondary objectives:

- To identify, and investigate heterogeneity in, variables associated with dimensions of health capability
- To illuminate individual abilities and societal conditions that affect people's ability to avoid morbidity and mortality secondary to chronic hepatitis B (CHB)
- To measure individuals' ability to access health facilities

Outline



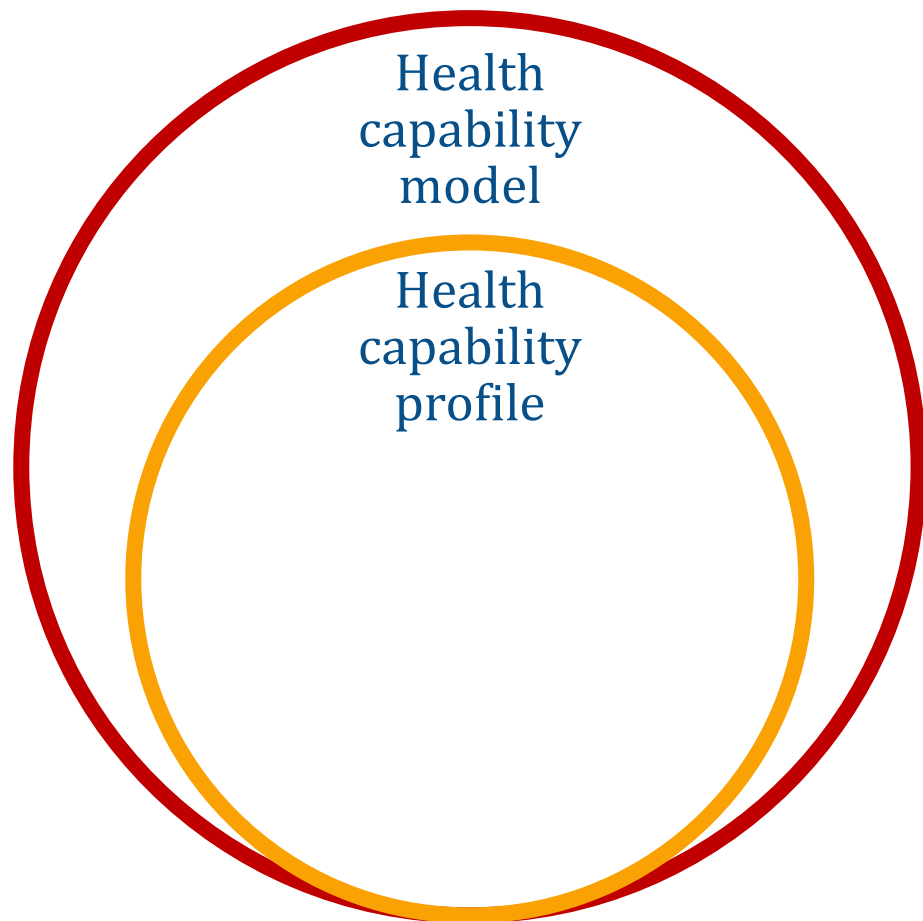
Health
capability
model



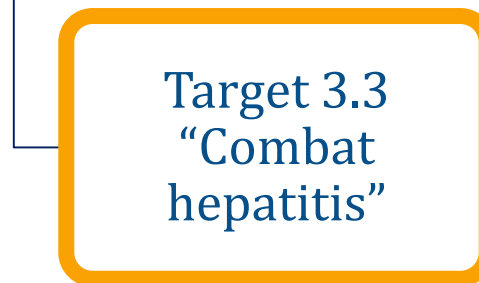
SDG 3: Ensuring
healthy lives

Chapter 1

Outline

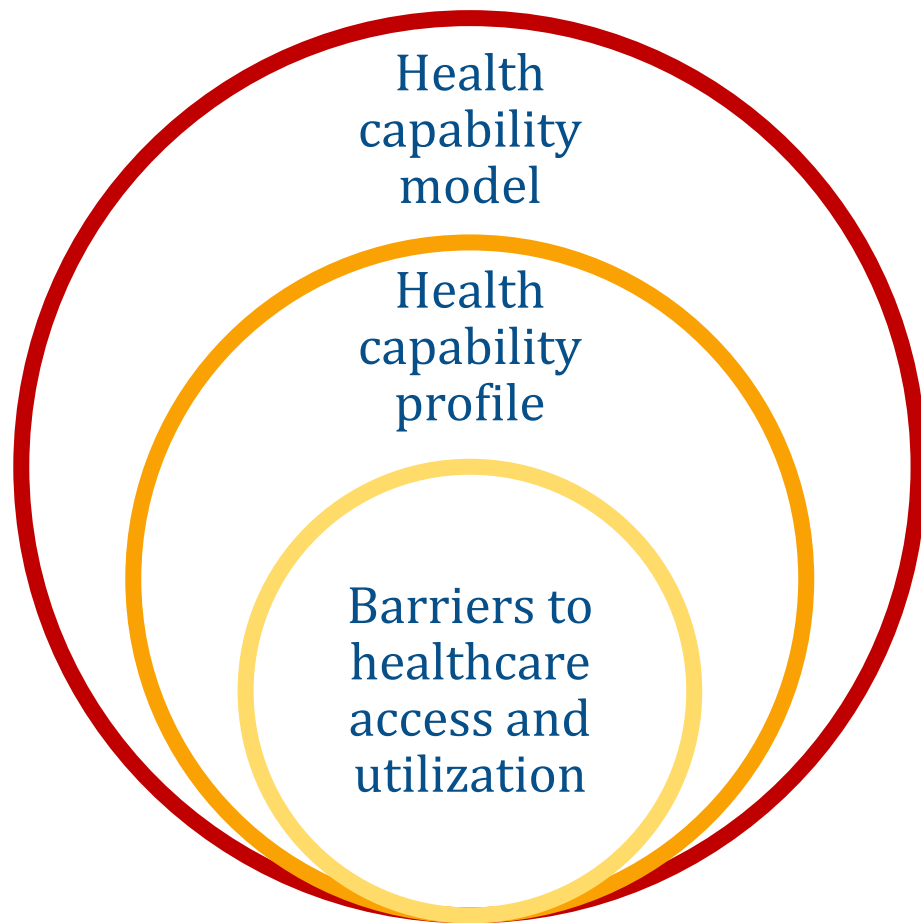


Chapter 1



Chapter 2

Outline



SDG 3: Ensuring healthy lives

Chapter 1

Target 3.3
"Combat hepatitis"

Chapter 2

Target 3.8
"Achieve universal health coverage"

Chapter 3

Chapter 1

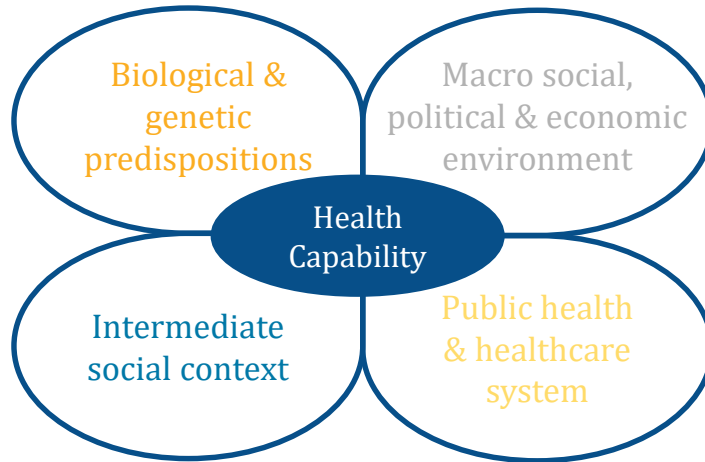
Structural Equation Modeling of Health Capability

Research question

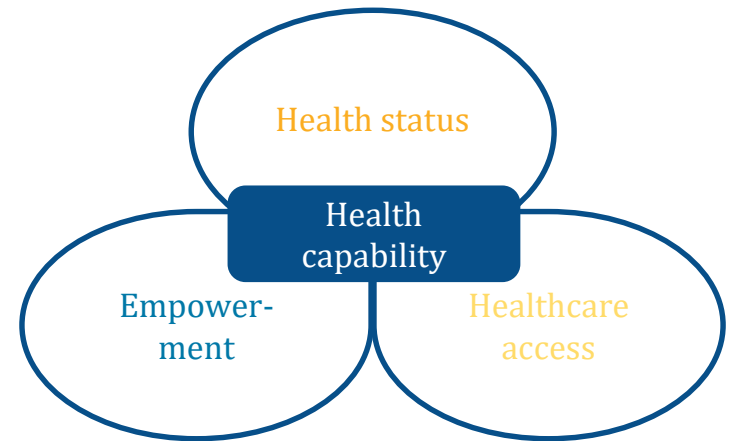
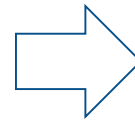
- Economic resources affect health outcomes but, in sub-Saharan Africa, most people with health needs are not found in poor households (Brown et al., 2019)
- ⇒ **Can a multidimensional model of health capability unpack the relationship between household poverty and individual health needs?**

Methods

- Health capability: the **ability to effectively achieve optimal health**

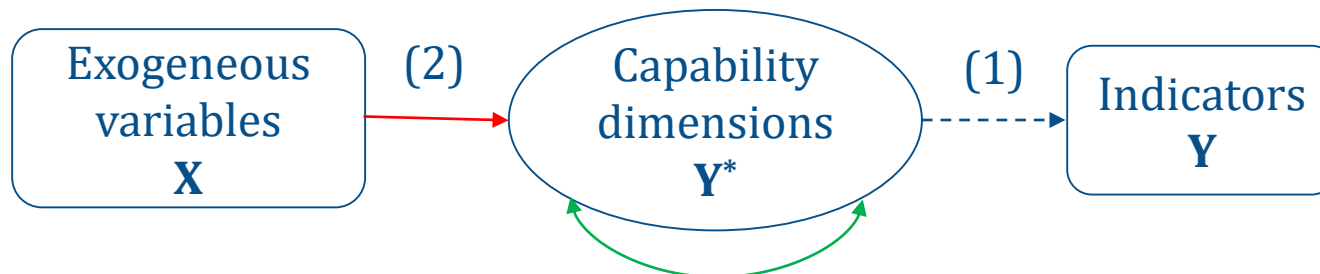


Theoretical framework

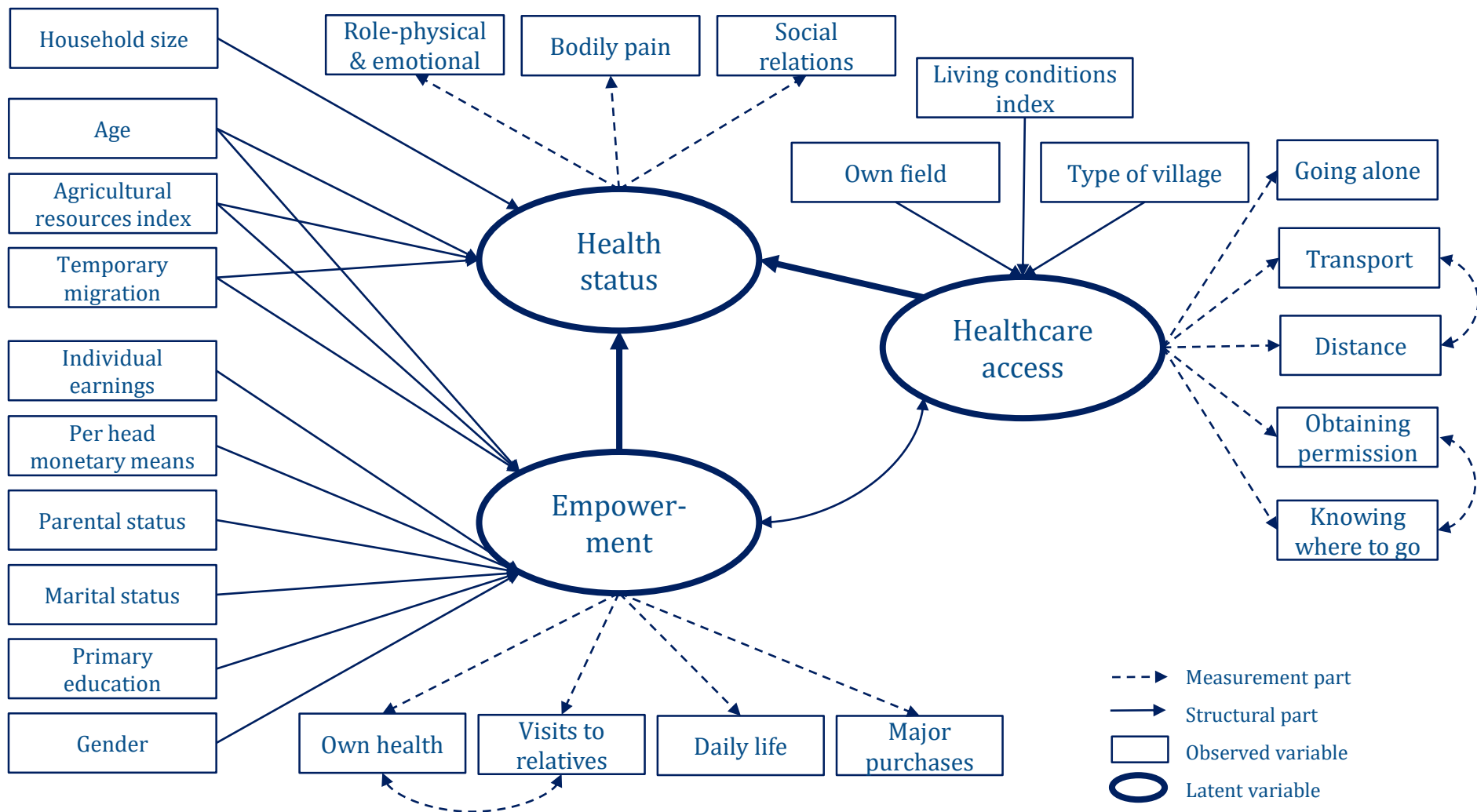


Adaptation

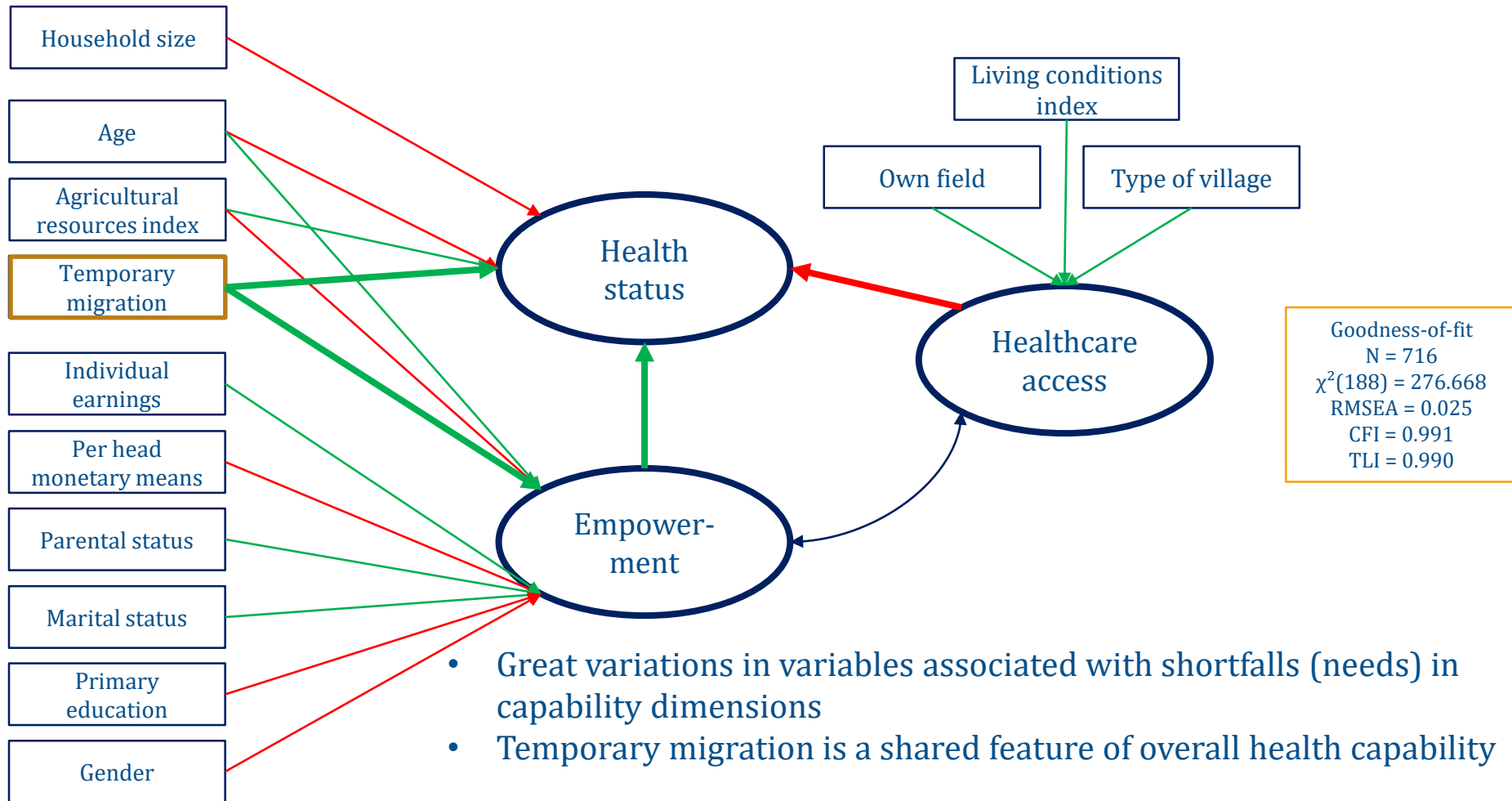
- Econometric model: SEM à la Krishnakumar (2007)



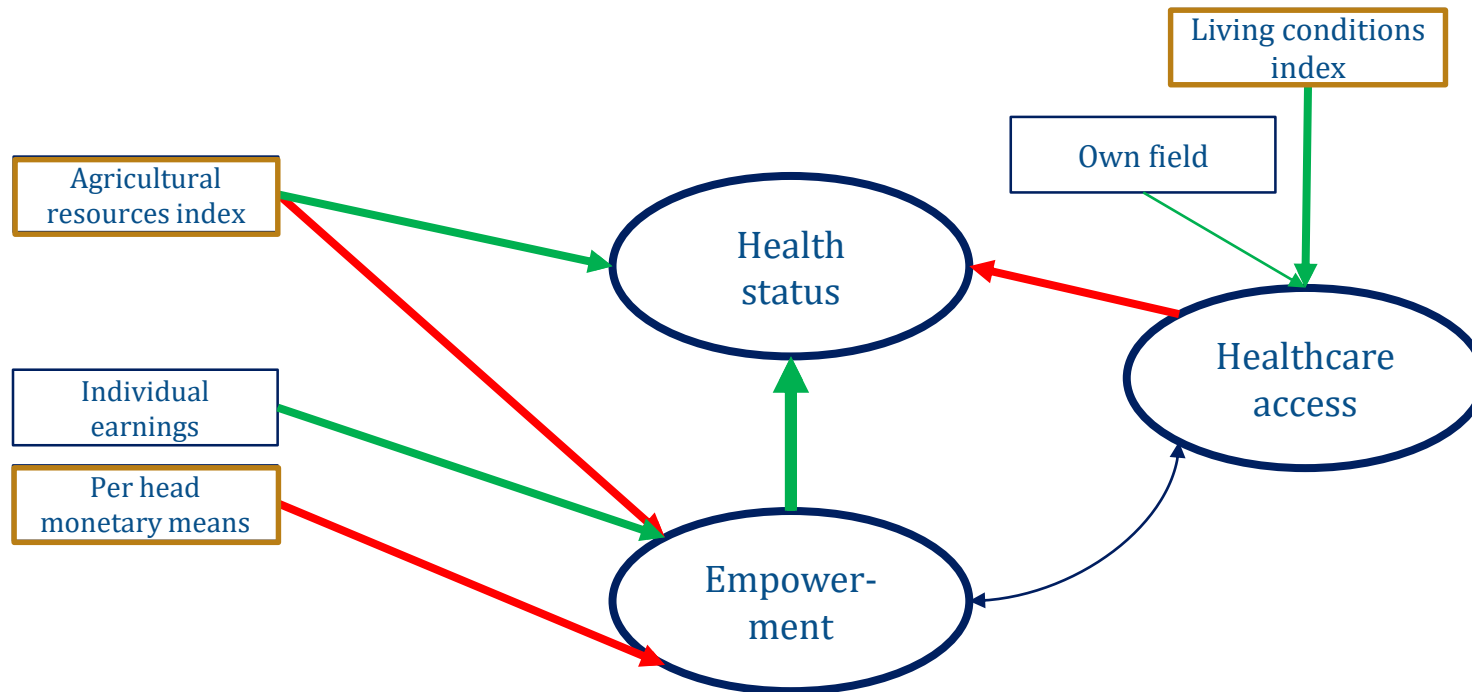
Health capability model in rural Senegal



Health capability model in rural Senegal



Health capability model in rural Senegal



- Individuals living in resource-rich households are more likely to experience lower levels of empowerment while reporting better health, and optimal access to health services.
- Empowerment increases with individual earnings, and is significantly associated with improved health status.

Discussion

Implications

1. One policy, for example towards the 'poor' households, necessarily fails to address significant deficits in health capability dimensions
 - It is imperative to account for the multidimensionality of, and inequalities in poverty, and empowerment
2. A SEM-based health capability model offers a way ahead
 - To accurately target **differentiated interventions** to improve health status, empowerment, and healthcare access
 - To prioritize resource allocation towards most **vulnerable individuals** and **shared levers** for overall health capability

Limitations

- Self-reported data, external validity, incomplete model

Chapter 2

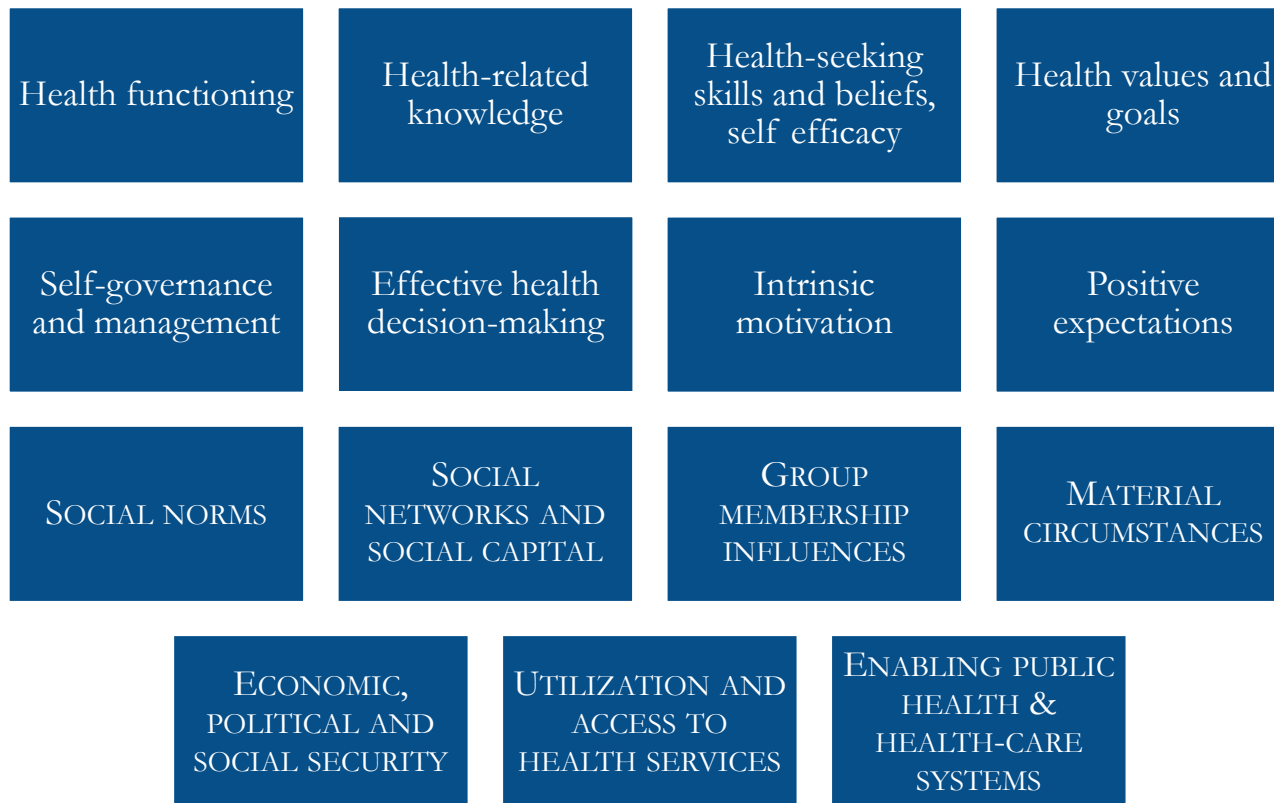
Investigating Health Capability in people living with Chronic Hepatitis B

Research question

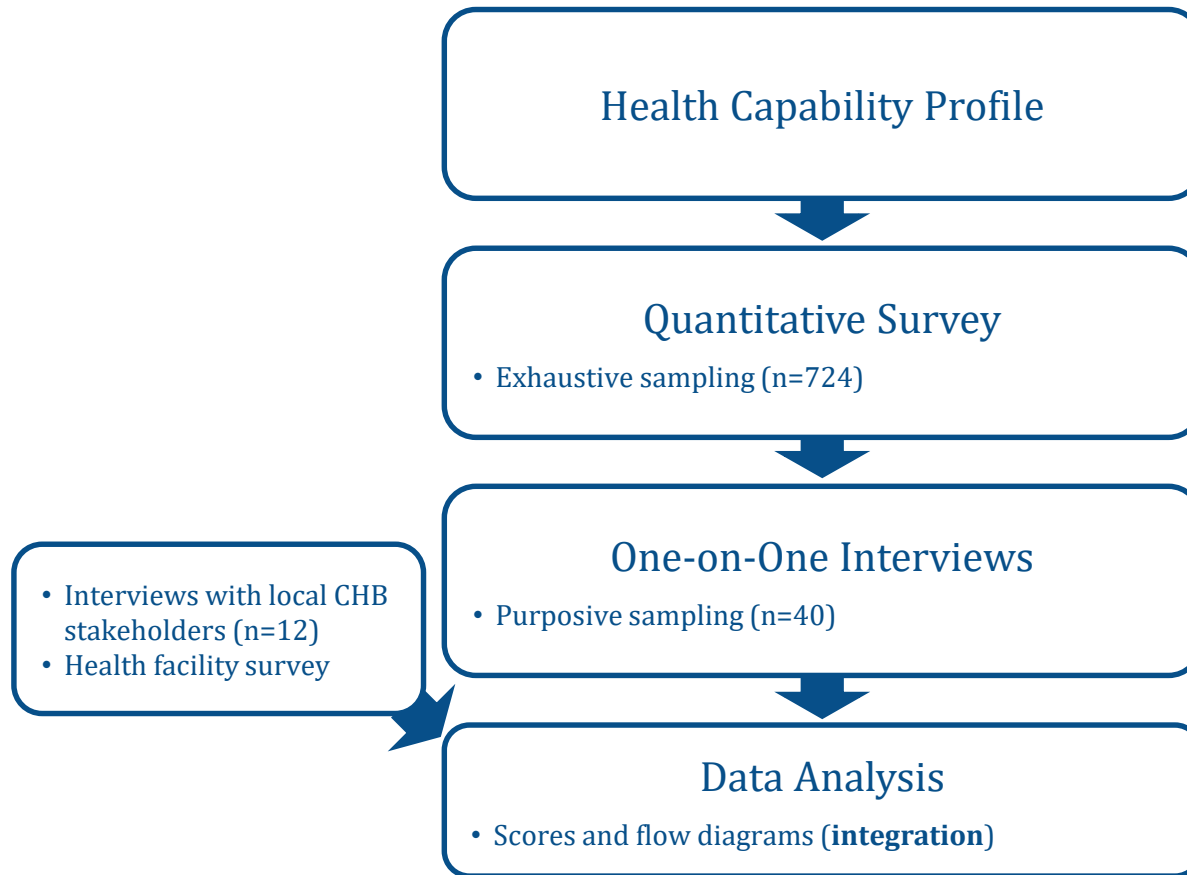
- Chronic hepatitis B (CHB) is completely avoidable and yet it remains one of the leading causes of cancer, and death in Senegal.
- ⇒ **Can an empirical application of the health capability profile provide a full picture of what plays into people's ability to avoid CHB-related morbidity and mortality?**

Health Capability Profile

- 15 inter-related **abilities** and **CONDITIONS** constituting the health capability *profile* of an individual



Methods



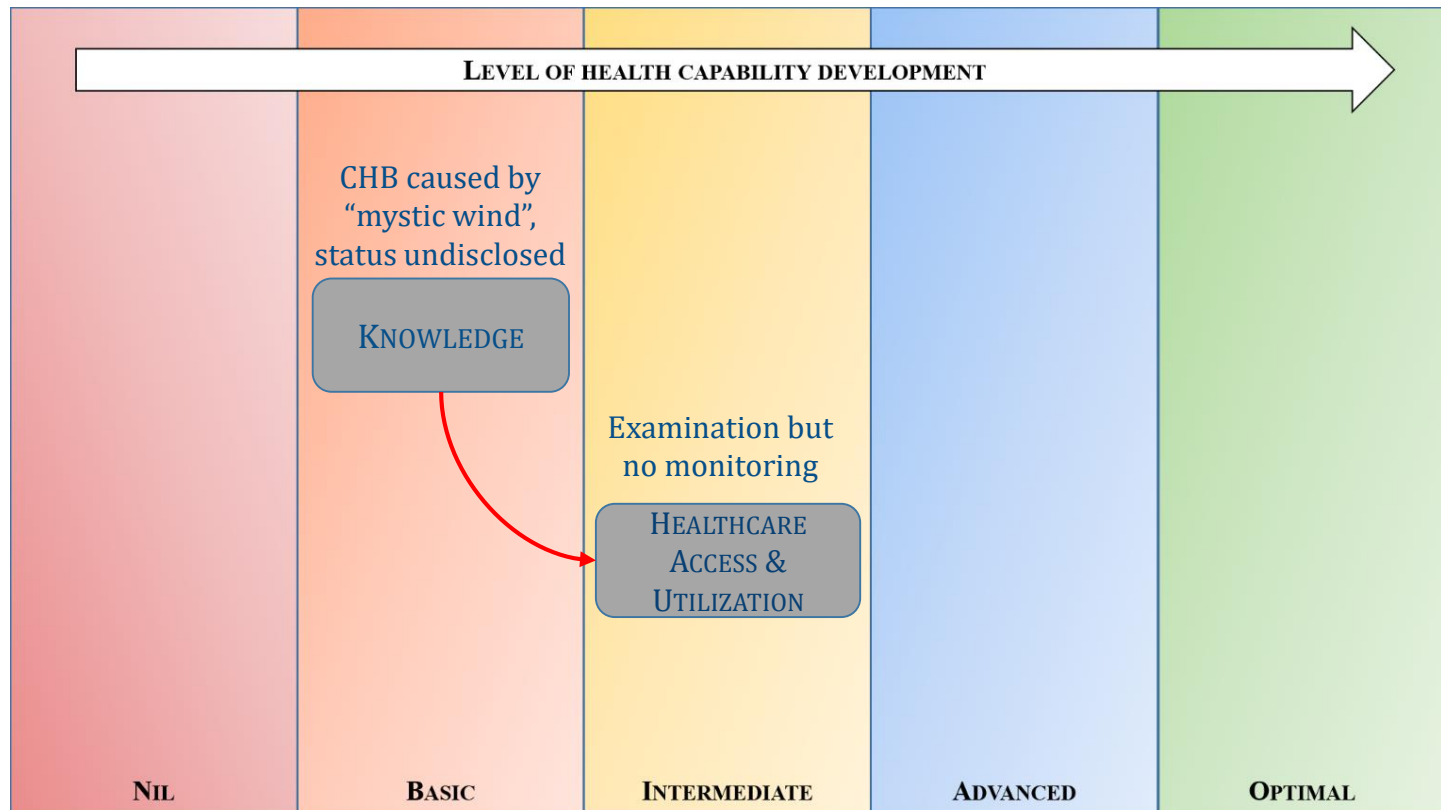
Scores and stages of development

Score	Stage of Capability development	Internal Capability “The individual is...”	External Capability “The conditions are...”
0	Absence/Nil	Naive	Unpropitious
10	Basic 1	Novice	Non-hindering
25	Basic 2	Advance beginner	Promising
40	Intermediate 1	Autonomous	Propitious
55	Intermediate 2	Competent	Favorable
70	Advanced 1	Experienced	Facilitating
85	Advanced 2	Proficient	Enabling
100	Optimal	Expert	Fully enabling

- Scoring table derived for each of the 15 capabilities in the study setting
- Scores averaged (individual, health capability)

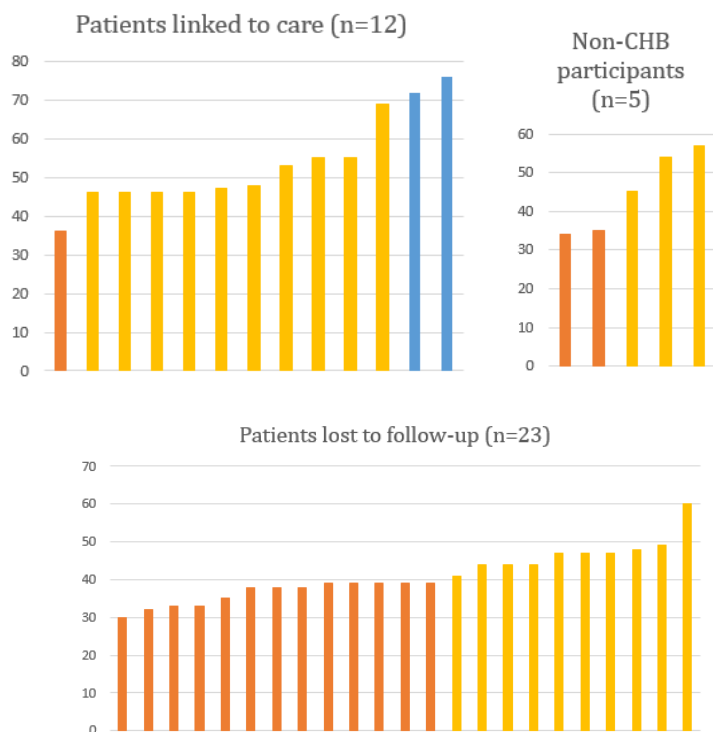
Flow diagrams

- Developed for all participants (n=40)
 - Include **influences** among capabilities

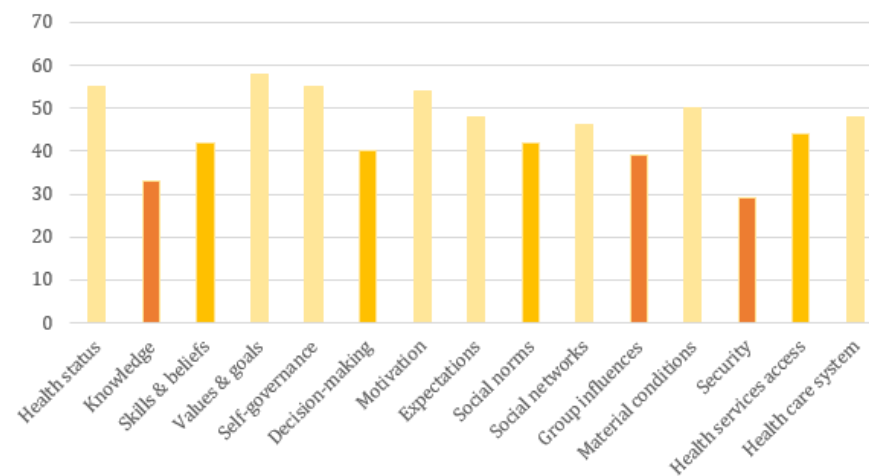


Results: scores and stages of development

Individual level



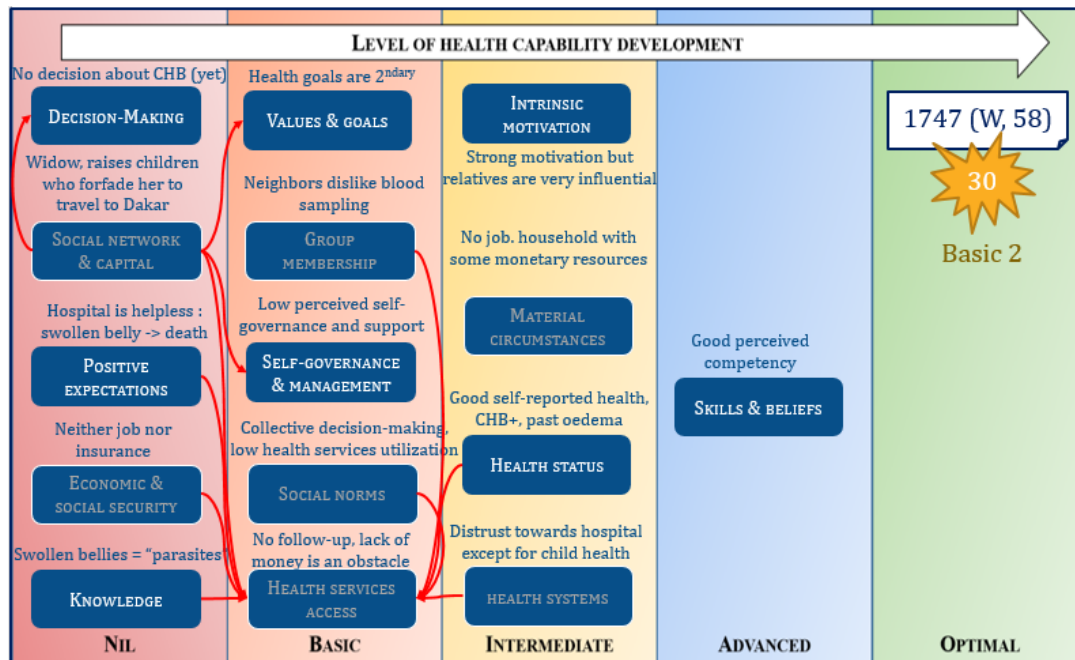
Health capability level



Stage of development: **basic**/lower intermediate/upper intermediate/advanced

Results: detailed analyses

Individual level



Health capability level

CHB-related knowledge (internal capability n°2)		
Health capability elements	Strengths and positive examples	Weaknesses & vulnerabilities
Own hepatitis B and vaccination status	Own status sometimes described through parallel with HIV/AIDS as an invisible, dormant, "blood disease"	Denial and/or low awareness of own CHB and vaccination status
CHB transmission routes, evolution, Vaccination, testing, and treatment	Recognized as the disease of the bellies, swollen bellies, "pregnant men", and often heard of people who died from it; some awareness of the existence of a vaccine	Name hepatitis B not recognized, no denomination in Sereer; confusion with "païs" (yellow eyes/fever) or completely different diseases: stroke, diarrhea
CHB risk factors	Smoking and alcohol sometimes mentioned as risk factors; exercise and diet named as related healthy behaviors	Confusion on modes of transmission: salamander pee, dirty water or cutlery, tapeworm - often associated with sorcery: cursed food, magic wind, etc.
Modes of information gathering	Main modes of <i>reliable</i> information gathering are radio, posters on baobabs, and healthcare professionals	Rumors circulating on social networks, talks with the elderly advising to consult shamans or traditional practitioners

Key results

1. **Non-CHB** participants exhibited **basic or intermediate stages** of health capability development
 - ⇒ **Widespread infectious disease** rather than individual behavior/characteristics
2. **High material circumstances** and **knowledge** were *not* systematic determinants of linkage to care
 - ⇒ Several cases of **denial** (e.g., sun tampered with results)
3. **Low** CHB-related **knowledge** was not an obstacle *per se*
 - ⇒ **Family history** or fear of **CHB-related death**: a strong lever for individual and family mobilization
 - ⇒ Detrimental when tied into **traditional or alternative medicine** beliefs or practices
4. Internal capabilities were at lower stages of development in **younger, female** and/or **illiterate** participants
 - ⇒ Shortfalls in self-efficacy, self-governance, decision-making, social norms
5. **Social and economic insecurity** documented in even the strongest profiles
 - ⇒ A **major threat to retention** in CHB care (e.g., pregnancy, money “invested in something else”)

Discussion

Contributions

- First empirical application of the profile (tools, data integration)
- Individual-level analysis (case management)
- Rich policy guidance
 - Comprehensive (all capabilities)
 - Content (strengths/vulnerabilities)
 - Priority (individuals, area of capability)

Limitations

- Incomplete quantitative survey
- External validity

Chapter 3

Measuring people's abilities to access health services

Research question

- Health services coverage and healthcare utilization offer an incomplete view of access to health services
- ⇒ **Can self-reported, perceived barriers to medical care be employed as a measure of access to health services?**

Data

CMUtuelleS survey conducted in 2019-2020 in the Niakhar HDSS following purposeful sampling (beneficiary and main partner) among **1,787** individuals.

- **Module based on DHS questions**
 - **6 items** on obstacles to healthcare seeking (knowing where to go, permission, money, distance, transport, going alone)
- **Determinants of healthcare-seeking**
 - Standard demographic variables, household resources (poverty, expenditures), and distance to the health facility (GPS coordinates)
- **Health services utilization**
 - Foregone at the household level
 - Participants with a recent episode of illness (n=418)
 - Women with recent live birth (n=197)

Methods

Building the score

1. Sample adequacy

- Bartlett's test for sphericity and Kaiser-Meyer-Olkin measure

2. Selection of items

- Stepwise descendents Explanatory Factor Analysis (EFA), with Kaiser criterion (eigenvalues > 1.1) and rotations
- Cronbach's alpha (internal consistency) on the final set of items, averaged into a **factor-based score**

Validating the score

1. *Content* validity: determinants of healthcare seeking

2. *Predictive* validity: health services utilization

- Methods: univariate regressions

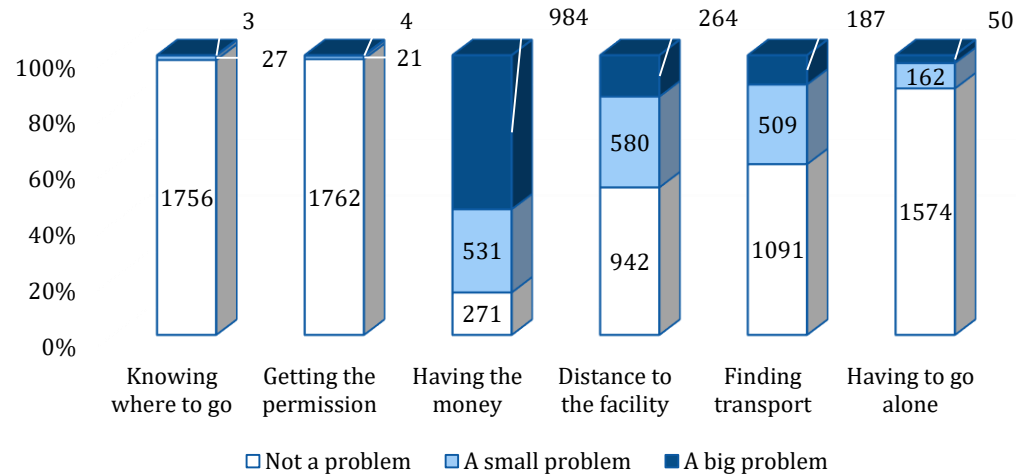
$$Y_i = \alpha + \beta \text{Score}_i + \varepsilon$$

Confirming the score

- Confirmatory factors analysis and external validity on the AmBASS dataset (general population)

Main results

Perceived barriers to medical care



Building the PBMC score

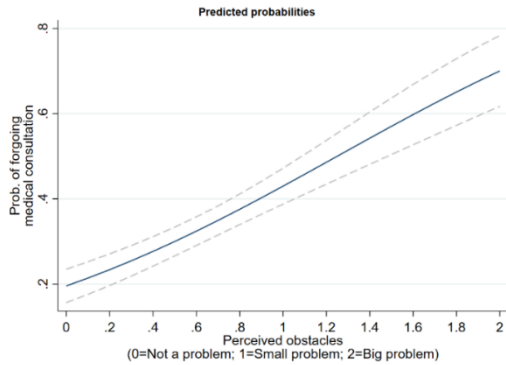
- EFA retains 4 items: money, distance, transport and going alone
- Internal consistency ($\alpha = 0.70$)

Content validity

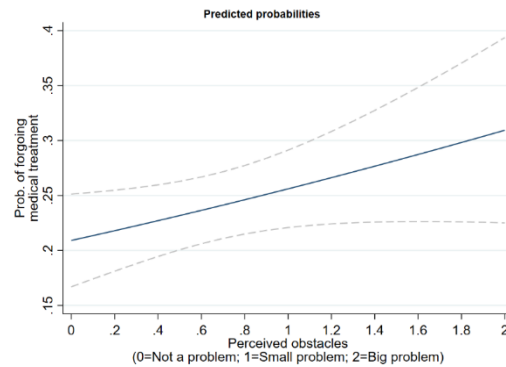
- Association with determinants of healthcare seeking (gender, education, poverty, geographical distance to the health facility, etc.)
 - No association with catastrophic health expenditures

Predictive validity

All participants (n=1787)

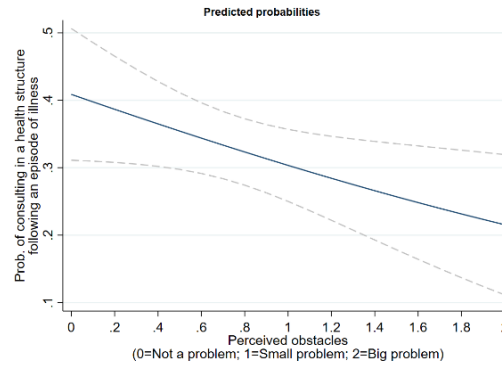


Forgone consultation (household)

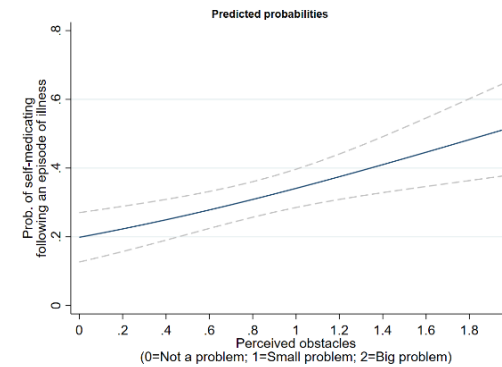


Forgone medication (household)

Recent episode of illness (n=498)

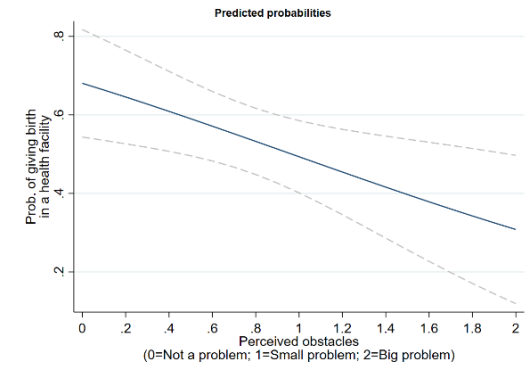


Consultation

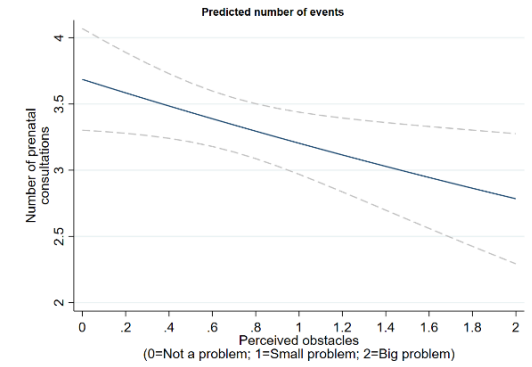


Self-medication

Recent pregnancy (n=197)



Birth in a health facility



Number of prenatal consultations

Discussion

Takeaways

- The PBMC score captures important aspects of people's abilities to access health services
- It is a simple and valid measure (computation, content, prediction)

Limitations

- Structure of the score could be sample dependant
- Self-reported variables (psychological bias; e.g., risk aversion)
- Fails to capture some aspects of access (e.g., quality, perception of a need) and of the supply-side (e.g., services availability)

Discussion

Contributions

1. Combining a set of **quantitative and qualitative methods** that enable to measure health capability in the context of rural Senegal
 - Models for future applications
 2. Highlighting **overlooked aspects of health** (capability) **promotion**
 - Empowerment is the missing puzzle piece in the relationship between poverty and health
 - Economic and social insecurity is a major threat to hepatitis B elimination
 3. Providing **informative results** for policy
 - Comprehensive (width, heterogeneity, interdependence)
 - Priority/equity (cumulative vulnerabilities, shortfall inequality)
- ⇒ It is both **feasible** and **illuminating** to empirically apply health capability