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Healthcare access: A sequence-sensitive approach

Marco J. Haenssger^{a,b,c,d,e,*}, Proochista Ariana^{a,c}^a Centre for Tropical Medicine and Global Health, Nuffield Department of Medicine, University of Oxford, Old Road Campus, Roosevelt Drive, Oxford OX3 7FZ, UK^b CABDyN Complexity Centre, Saïd Business School, University of Oxford, Park End Street, Oxford OX1 1HP, UK^c Technology and Management Centre for Development, Oxford Department of International Development, University of Oxford, 3 Mansfield Road, Oxford OX1 3TB, UK^d Green Templeton College, 43 Woodstock Road, Oxford OX2 6HG, UK^e Economics and Translational Research Group (ETRG), Mahidol Oxford Tropical Medicine Research Unit (MORU), Faculty of Tropical Medicine, Mahidol University, 3/F, 60th Anniversary Chalermprakiat Building, 420/6 Rajvithi Road, Bangkok, Thailand

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ABSTRACT

It is widely accepted that healthcare-seeking behaviour is neither limited to nor terminated by access to one single healthcare provider. Yet the sequential conceptualisation of healthcare-seeking processes has not diffused into quantitative research, which continues to analyse healthcare access as a “one-off” event. The ensuing lack of understanding healthcare behaviour is problematic in light of the immense burden of premature death especially in low- and middle-income countries. This paper presents an alternative approach. Based on a novel survey instrument, we analyse original survey data from rural India and China that contain 119 unique healthcare pathways among 637 respondents. We offer three applications of how such sequential data can be analysed to enhance our understanding of people's health behaviour. First, descriptive analysis of sequential data enables more a comprehensive representation of people's health behaviours, for example the time spent in various healthcare activities, common healthcare pathways across different groups, or shifts in healthcare provider access during a typical illness. Second, by analysing the effect of mobile technology on healthcare-seeking process characteristics, we demonstrate that conventional, sequence-insensitive indicators are potentially inconsistent and misleading approximations when compared to a more precise, sequence-sensitive measure. Third, we describe how sequential data enable transparent and flexible evaluations of people's healthcare behaviour. The example of a sequence-insensitive evaluation suggests that household wealth has no statistical link to an illustrative “ideal” form of public healthcare utilisation. In contrast, sequence-sensitive evaluations demonstrate that household wealth is associated with an increased likelihood of bypassing referral processes and approaching unregulated and costly informal and private practitioners before accessing a public clinic. Sequential data therefore do not only reveal otherwise neglected locational idiosyncrasies, but they also yield deeper insights into the drivers of people's health behaviours compared to a conventional approach to “access to healthcare.”

1. Introduction

People in low- and middle-income countries die on average more than 20 years younger than high-income-country citizens (Institute for Health Metrics and Evaluation, 2012; World Bank, 2015). In the context of the 2030 Sustainable Development Goals, the current Universal Health Coverage agenda calls for widespread and timely access to healthcare to relieve poor households in low- and middle-income countries from this disease burden and from associated catastrophic health expenditures (Summers, 2015). However, access to healthcare is not a straightforward concept because people's health

decisions are often subject to constraints like poverty, access to finance, time restrictions, or lack of quality healthcare providers. Healthcare-seeking processes under such constraints can result in various combinations of “no care,” “self-care,” and healthcare from many different practitioners (Kibadi et al., 2009; MacKian et al., 2004; Nyamongo, 2002; Obrist et al., 2007; Pool & Geissler, 2005; Samuelsen, 2004; Smith & Mbakwem, 2007). Medically trained public and private providers (doctors and nurses) thereby account for as little as 10% of the healthcare providers in some low- and middle-income countries, the remainder comprising informal caregivers and traditional healers whose varying skills and quality can delay or undermine successful

* Corresponding author.

E-mail addresses: marco.haenssger@ndm.ox.ac.uk (M.J. Haenssger), proochista.ariana@ndm.ox.ac.uk (P. Ariana).<http://dx.doi.org/10.1016/j.ssmph.2016.11.008>Received 9 July 2016; Received in revised form 23 November 2016; Accepted 29 November 2016
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treatment (Das et al., 2008; Mwabu, 2007; Sudhinaraset et al., 2013). Complexities such as these underline the importance of understanding people's healthcare-seeking behaviour as a precondition for attaining universal health coverage and improving health in low- and middle-income countries.

The process of navigating health systems with multiple actors is captured in the concepts of “healthcare pathways” or “therapeutic itineraries:” Healthcare seeking can be understood as a multi-step process during which more than one actor or healthcare provider may be accessed. Although conceptually established and applied in qualitative research (e.g. Balabanova et al., 2009; Risso-Gill et al., 2015), the sequential understanding of healthcare-seeking behaviour has yet to permeate quantitative public health research. The majority of quantitative analyses of healthcare behaviour in low- and middle-income countries instead adopts a single-stage approach, implying that the patient “chooses” once from a portfolio of healthcare options (Gómez-Olivé et al., 2013; Hardon, 1987; Mohan et al., 2008; Moshabela et al., 2012). Such simplified single-stage analyses can help to track national progress towards achieving universal health care by providing simplified and standardised measures of healthcare access that allow for easy measurement and comparison. However, we will demonstrate in this paper that an insufficient appreciation of healthcare pathways can mislead our understanding of healthcare access.

A number of multi-purpose household surveys have started to acknowledge that healthcare-seeking involves more than one single healthcare provider (e.g. the Indian Human Development Survey, or the World Bank Living Standards Measurement Survey in Tanzania; Desai & Vanneman, 2016; National Bureau of Statistics, 2014). Yet, analyses that embrace sequential healthcare data are rare. Balabanova and McKee (2002) are a notable exception, using detailed pathway data that include up to three stages of access in order to understand patient flows through the formal health system in Bulgaria. Despite the rich and large-sample data, the pathway analysis in this study excludes informal healthcare providers and activities such as ignoring or self-treating an illness, both of which are essential for a holistic understanding of healthcare trajectories. The limited number of reported healthcare pathways in their survey (resulting from the size of the original sample drawn, the focus on formal care, and the 4-week recall period) requires Balabanova and McKee (2002) to consolidate the pathway data into aggregate utilisation statistics for different providers, which prevents a sequence-sensitive analysis of the healthcare-seeking process. Hamid et al. (2015), who use a household survey in Bangladesh to record the first two steps of the healthcare-seeking process, apply a similarly sequence-insensitive strategy.

Whereas Balabanova and McKee (2002) and Hamid et al. (2015) analyse survey data, quantitative analyses of healthcare pathways are often based on qualitative data collection methods. For instance, Nyamongo (2002) examines the healthcare behaviour of a sample of 38 persons in Kenya over a period of ten months through ethnographic observation. The author analyses the data statistically to highlight the transitions between different forms of treatment, but the ethnographic approach is impractical for the collection and quantitative analysis of representative healthcare behaviour data.

These quantitative studies are exceptions in the literature and most studies of sequential healthcare-seeking processes are qualitative (Kibadi et al., 2009; Moshabela et al., 2011; Shaikh et al., 2008). Qualitative research is an important basis for understanding the complexity of health behaviour and for quantification through surveys (Risso-Gill et al., 2015), but the surprising absence of complementary quantitative research—which appears to result from the lack of in-depth methodological work in this area—is an obstacle to identifying representative healthcare pathways, to understanding the determinants of variations in health behaviour on the population level, and to measuring the effect of development processes and interventions on people's health behaviour. By demonstrating that the analysis of healthcare access as a sequential process can improve our under-

standing of people's health behaviour and its determinants, our paper aims to stimulate the more widespread use of sequential data analysis techniques in quantitative public health research.

The following section outlines the data source and survey instrument to capture healthcare-seeking sequences in our rural field sites, whereby 119 unique healthcare trajectories among 637 respondents in rural India and China emerge. Section 3 illustrates how this data can be analysed: We characterise and compare healthcare sequences in rural India and rural China (Section 3.1), demonstrate that a sequence-sensitive analysis is more precise than an aggregate analysis of healthcare access (Section 3.2), and illustrate how sequence characteristics allow for the evaluation of healthcare-seeking behaviour beyond “access / no access” indicators (Section 3.3). Section 4 summarises the limitations of this paper, compares the relative strengths and weaknesses of the sequence-sensitive and the aggregate approaches, and discusses the applicability of our method.

2. Material and methods¹

Our analysis draws on original survey data from the general population in the rural areas of Rajasthan in India and Gansu in China. The data was collected in 2014 among a cross-section of 800 adults aged 18 years and above, using a three-stage stratified cluster random sampling design. An important feature of our survey instrument was the collection of sequential healthcare pathway data that is subdivided into discrete steps of activities; their description, duration, and location; and—owing to the study focus on health-related mobile phone use—the types of mobile phone use that occurred during each step (an excerpt of the instrument is presented in the [Supplementary Material, Appendix A1](#)). In addition, we collected overarching process data including self-described symptoms and severity of the illness, the total costs incurred, and the total process duration. Fig. 1 presents a hypothetical example of such a process, where a respondent first ignores an illness after it had been detected, then engages in self-treatment with medication at home, subsequently accesses a public hospital and a private doctor, and concludes with a week-long period of continuing medication at home.

One respondent could report up to three illness episodes in our survey, including one acute “severe” illness, one acute “mild” illness, and one “long-term, recurrent, or chronic” condition. The severity of the acute illness episodes (“mild” or “severe”) was based on the respondents' self-assessment; that is, whether the respondent would consider a recent illness or accident “severe” and acute (rather than e.g. recurrent or long-term). The focus on respondents' self-assessment means that people might report an acute illness episode of an underlying yet undiagnosed chronic condition. Although this approach limits our ability to make epidemiological claims, we argue that this self- and collectively perceived severity of an illness is more relevant for people's healthcare-seeking decisions than what subsequent medical diagnosis would reveal (see e.g. Leventhal et al., 2008). We limit our analysis in this paper to acute conditions that occurred over the past year (compared to previous studies, our sample of multi-stage pathways is therefore wider but faces different recall issues – note the illustrative nature of our analysis). “Chronic and long-term” healthcare-seeking pathways follow distinctively different patterns (e.g. repeated cycles of consultation and home treatment).

Our survey captured eleven possible activities in each step and a maximum of seven steps per illness episode. The illness episode was defined by the moment from which the respondent recognised a discomfort to the point when the healthcare-seeking process stopped because the illness was cured or the symptoms simply disappeared. A

¹ The research was approved by the Social Sciences and Humanities Inter-Divisional Research Ethics Committee of the University of Oxford, by the Gansu Province Department of Statistics (Ref. 2014/8), and by the internal ethics commission of the Indian Institute of Health Management Research, Jaipur.

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