Evaluating performance-based financing in low-income and middle-income countries: the need to look beyond average effect

Peter Binyaruka, Julia Lohmann, Manuela De Allegri

INTRODUCTION

Over the last decade, performance-based financing (PBF) has gained momentum as a health financing innovation, which combines linking healthcare payments to performance with increased provider autonomy and supervision.\(^1\)\(^2\) The combination of these elements is expected to boost supply-side efforts towards increasing quantity and quality of service provision, triggering a demand-side response towards improved service utilisation.\(^3\)\(^4\)

A recent paper by Paul et al has critically questioned the widespread introduction of PBF in light of the limited available evidence on its effectiveness.\(^5\) The response to this paper has been varied, with authors advancing arguments for and against PBF. Some African PBF implementers have claimed that PBF is an evolving strategy with potential benefits on health systems despite its existing challenges.\(^6\) Others have drawn attention to the unintended consequences of PBF\(^7\) or to the need to assess the economic value of such an approach.\(^8\) Beyond their diverse arguments, however, most authors have concurred with Paul et al\(^9\) on the limited scope of currently available evidence and have postulated the need to better assess how PBF works under different contextual constraints within and across settings.

Our commentary positions itself against this background, acknowledges the limited scope of current evidence on PBF, and explicitly argues in favour of devoting more effort to unravel heterogeneity across and within settings. Our argument is based on the recognition that by virtue of how impact evaluations are designed, the focus has been on the average effect, which masks important heterogeneity across settings, providers and users.\(^10\)\(^11\)\(^12\) To date, only a handful of studies have assessed heterogeneity of PBF effects across population subgroups\(^13\)\(^14\)\(^15\) or across health providers.\(^16\)\(^17\)\(^18\) Similarly, little attention has been devoted to understanding which factors can explain heterogeneity in the response to PBF or why PBF stimulates changes in some instances, but not in others.\(^3\)\(^4\)\(^19\)

In light of the above, we call for more systematic analyses of heterogeneity, defined in relation to both the need to report differential effects and the need to understand what drives or explains such differential effects within and across settings. We first define and outline potential sources of heterogeneity and then offer initial guidance on how to measure and understand heterogeneity.

Potential sources of heterogeneity in PBF

PBF interventions are not uniformly designed or implemented across settings. Variations in
design, implementation models, and settings, inevitably lead to substantial heterogeneity in PBF programmes and eventually effects. However, publications rarely detail these variations, inevitably omitting underlying programme heterogeneity and hence nurturing a false view of PBF as a monolithic intervention. Furthermore, within a single setting, PBF addresses organisational units and actors whose intrinsic diversity represents an additional source of heterogeneity for PBF implementation and effects. Hereafter, we address three key sources of heterogeneity.

**How to measure heterogeneity in PBF**

Having acknowledged diverse sources of heterogeneity, we provide some initial practical guidance on how to look beyond average programme effects using both quantitative and qualitative methods, the former being oriented at measurement and the latter at in-depth understanding. The propositions below can be applied to assess heterogeneity across a wide range of PBF-related outcomes, including providers’ motivation and performance, health service utilisation and quality of service provision.

**Capture health systems factors, community and population characteristics**

One’s capacity to assess heterogeneity begins with having access to comprehensive information on the characteristics of both healthcare providers implementing PBF and target communities. Similarly, information on contextual elements, implementation models and implementation fidelity at different levels of the health system is needed. Depending on the specific focus of one’s analysis, this information can be captured quantitatively through use of routine data sources (eg, Health Management Information Systems), facility-based and population-based surveys, or qualitatively through means of document reviews, observations and interview methods.

**Identify relevant subgroups to analyse heterogeneity of PBF effects**

The identification of potential sources of heterogeneity can be done through data disaggregation. This entails categorising data by key actors (eg, different sets of providers/users), by setting (eg, rural–urban, different districts), by different implementation models and different levels of implementation fidelity, or by any other conceptually pertinent factor, including, for example, facilities baseline performance levels or managerial capacity. Assessing heterogeneity quantitatively or qualitatively effectively entails having sufficient information to allow for subgroup analysis (comparison between groups) in relation to any of the above-mentioned categories. This of course relies on having engaged in comprehensive data collection efforts from the onset of the study and on defining relevant subgroups in relation to relevant sources of heterogeneity, the specific research questions being addressed, the study conceptual model or the intervention broader contextual elements.

**Select an appropriate analytical approach**

When assessing heterogeneity quantitatively, the choice for an appropriate quantitative analytical approach largely relies on the typology of the data available—time series data, panel data or repeated cross-sectional data—as well as on the specific research question being addressed. Within the PBF literature in low-income and middle-income countries, only a few studies to date have explicitly used interactions terms and/or stratified analysis to assess differential impacts across subgroups of providers and users. Some authors have proposed additional analytical options to estimate heterogeneity...
of programme effects. For instance, some authors have used quantile-specific treatment effects,\textsuperscript{11,13} while others have used hierarchical linear models on propensity score strata to estimate the distributional impact of policies.\textsuperscript{20}

Assessing heterogeneity qualitatively means assessing how different constituencies within and across settings define and experience PBF in light of broader contextual and implementation-specific elements. Thematic descriptive qualitative analysis has largely dominated this body of literature.\textsuperscript{18} We note that with a few exceptions, quantitative and qualitative analytical approaches have to date rarely been merged into a single research effort to explore specifically heterogeneity in PBF effects.

**CONCLUSION**

With this brief commentary, we wish to inspire the research and policy community to look beyond average programme effects, devoting more attention towards measuring and understanding heterogeneity in PBF programmes and their effects. Understanding heterogeneity represents an essential step towards establishing the needed evidence base to inform country-level decisions as to whether PBF may be a suitable health financing option for a given setting. In addition, understanding heterogeneity and its sources also represents the initial step towards adjusting design and implementation to take into account the different actors and realities that may co-exist within a single setting.

**Twitter** Peter Binyaruka @peter_binyaruka, Julia Lohmann @julia_lohmann and Manuela De Allegri @ManuelaDe Allegr

**Contributors** PB conceptualised this commentary together with MDA. PB wrote the first draft of the commentary, while JL and MDA revised the commentary. All authors read and approved the final version.

**Funding** The authors have not received any funding for writing this commentary.

**Competing interests** None declared.

**Patient consent for publication** Not required.

**Provenance and peer review** Not commissioned; internally peer reviewed.

**Data availability statement** This article did not use any data.

**Open access** This is an open access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited, appropriate credit is given, any changes made indicated, and the use is non-commercial. See: http://creativecommons.org/licenses/by-nc/4.0/.

**ORCID iDs**

Peter Binyaruka http://orcid.org/0000-0002-1892-7985

Julia Lohmann http://orcid.org/0000-0003-4136-9296

**REFERENCES**


