



RESEARCH ARTICLE

Team- and individual-level motivation in complex primary care system change: A realist evaluation of the Salud Mesoamerica Initiative in El Salvador [version 1; peer review: 2 approved with reservations]

Wolfgang Munar ¹, Syed S. Wahid¹, Sangeeta Mookherji ¹, Cinzia Innocenti², Leslie Curry³

¹Milken Institute School of Public Health,, George Washington University, Washington, DC, 20052, USA

²Independent Researcher, San Salvador, El Salvador

³School of Public Health, Yale University, New Haven, CT, 06510, USA

v1 First published: 31 Oct 2018, 2:55
<https://doi.org/10.12688/gatesopenres.12878.1>
 Latest published: 31 Oct 2018, 2:55
<https://doi.org/10.12688/gatesopenres.12878.1>

Abstract

Background: We study the role of individual and team-level motivation in explaining large-scale primary care performance improvements in El Salvador, one of the top-performing countries in the Salud Mesoamerica Initiative.

Methods: Case study with outlier sampling of high-performing, community health teams in El Salvador. Design includes scoping review of literature, document review, non-participant observation, and qualitative analysis of in-depth interviews following a realist case study protocol.

Results: The interplay between program interventions and organizational, community and policy contexts trigger multi-level motivational mechanisms that operate in complex, dynamic fashion. Interventions like performance measurement and team-based, in-kind incentives foster motivation among individual members of high-performing teams, which may be moderated by working conditions, supervision practices, and by the stress exerted by the interventions themselves. Individuals report a strong sense of public service motivation and an overarching sense of commitment to the community they serve. At the interpersonal level, the linkage between performance measurement and in-kind incentives triggers a sense of collective efficacy and increases team motivation and improvement behaviors. The convening of learning forums and performance dialogue increases the stakes for high-performing teams, helps them make sense of performance data, and leads to performance information utilization for healthcare improvements. Closeness to communities creates strong emotional linkages among team

Open Peer Review

Approval Status ? ?

	1	2
version 1		
31 Oct 2018	view	view

1. **Joris Van de Klundert**, Erasmus University
 Rotterdam, Rotterdam, Netherlands Antilles
 Prince Mohammad bin Salman College of
 Business & Entrepreneurship, King Abdulla
 Economic City, Saudi Arabia

2. **Julia Lohmann** , Heidelberg University,
 Heidelberg, Germany

Any reports and responses or comments on the article can be found at the end of the article.

members that further increases collective efficacy and social identity. Such changes in individuals, team, and organizational behaviors can contribute to improved delivery of primary care services and explain the gains in performance demonstrated by the program.

Conclusions: This case suggests that primary care systems that rely on multi-disciplinary teams for the provision of care can benefit from performance measurement and management interventions that leverage individual and team-level motivation. Realist evaluation can help prioritize policy-relevant research and enhance the design and evaluation of large-scale performance reforms in primary care systems in low- and middle-income settings.

Keywords

Realist evaluation, Primary Care Systems, Performance Measurement and Management Systems, Workforce Motivation, El Salvador, Salud Mesoamerica Initiative

Corresponding author: Wolfgang Munar (wolfgangmunar@email.gwu.edu)

Author roles: **Munar W:** Conceptualization, Formal Analysis, Funding Acquisition, Investigation, Methodology, Project Administration, Supervision, Writing – Original Draft Preparation, Writing – Review & Editing; **Wahid SS:** Conceptualization, Investigation, Methodology, Visualization, Writing – Original Draft Preparation, Writing – Review & Editing; **Mookherji S:** Investigation, Writing – Original Draft Preparation, Writing – Review & Editing; **Innocenti C:** Investigation, Writing – Review & Editing; **Curry L:** Conceptualization, Methodology, Writing – Original Draft Preparation, Writing – Review & Editing

Competing interests: No competing interests were disclosed.

Grant information: This work was supported by the Bill and Melinda Gates Foundation (grant number OPP1154415).
The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.

Copyright: © 2018 Munar W *et al.* This is an open access article distributed under the terms of the [Creative Commons Attribution License](#), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

How to cite this article: Munar W, Wahid SS, Mookherji S *et al.* **Team- and individual-level motivation in complex primary care system change: A realist evaluation of the Salud Mesoamerica Initiative in El Salvador [version 1; peer review: 2 approved with reservations]** Gates Open Research 2018, 2:55 <https://doi.org/10.12688/gatesopenres.12878.1>

First published: 31 Oct 2018, 2:55 <https://doi.org/10.12688/gatesopenres.12878.1>

Introduction

Calls have been made for acquiring a better understanding of the ways in which various policy and management interventions contribute to improving the performance of primary care delivery systems, particularly in low- and middle-income countries (LMIC) where such improvements might be necessary conditions for the achievement of universal health coverage in the age of the Sustainable Development Goals^{1,2}. High-performing primary care systems can be not only the first point of contact for continuous, coordinated, comprehensive and people-centered health services, but can also provide critical preparedness and response to domestic and global public health threats³.

Despite growing interest in improving the performance of primary care systems, gaps in evidence and practice are particularly acute in the area of performance measurement and management (PMM) of primary care systems in LMIC⁴. In particular, the linkages between workforce motivation and performance improvement in LMIC primary care systems remain poorly understood. Recent global health research has favored studies that address the effectiveness of specific health interventions while insufficiently addressing the effects of cross-cutting, PMM interventions on organizational performance^{5–16}. Furthermore, experimental studies infrequently address the role of context in moderating the motivational effects of PMM interventions in the public-sector in general^{17–20}, and in LMIC primary care systems in particular^{21,22}.

This paper presents results from an ongoing realist evaluation of the Salud Mesoamerica Initiative (SMI). This is the first of a series of papers presenting results from such evaluation. Here, we report on the role of motivation on the performance of El Salvador's primary care system.

Background

Performance refers to the results generated by an organization, and measured against its intended goals and targets. In the private sector, it can refer to profits, efficiency, effectiveness, quality, market-share, and customer satisfaction. In public sector organizations, the definition has shifted as the role of the State in the delivery of public services has evolved²³. Governments' focus has shifted from inputs and compliance with standards, to quantity and quality of outputs, productivity, and efficiency and, more recently, to outcomes and policy impacts^{23,24}. PMM systems can inform the introduction of clinical, managerial, programmatic and policy changes and thus contribute to the production of socially valued outcomes such as equity and health gains⁴. Forty years of research on PMM systems in public and private organizations has shown that such systems can be effective, even though unintended or undesirable effects can also occur^{18,25–32}.

The literature on PMM interventions in primary care systems in LMICs was reviewed as part of the ongoing preparation of an evidence gap map, and major gaps were summarized in the evaluation protocol⁴. To address these gaps, one of the authors (WM) adapted a PMM framework⁴ originally developed by Pollitt to study organizational performance in the public sector³³. The framework in [Box 1](#) highlights the elements, inter-relations

and inter-dependencies that are typical of public-sector PMM systems and that usually determine the production of health outcomes (or not).

To categorize the various PMM interventions and outcomes of relevance to this evaluation, we also relied on an ongoing systematic review of the gaps in evidence in the literature⁴, and a taxonomy developed by the Cochrane Collaboration's Effective Practice and Organization of Care (EPOC)³⁴. [Box 2](#) summarizes the categories of interventions and outcomes as per the PMM framework in use.

Box 1. Performance measurement and management (PMM) system framework

The elements of a PMM system are: 1) An institutional and programmatic context in which health policies, programs and activities are implemented and in which organizations, actors and stakeholders interact; 2) A local, socio-economic context in which services are provided and where provider-community interactions occur; 3) One or more performance management interventions; 4) A process for measuring the results arising from the implementation of the policies, programs and activities referred to in 1 and 3 above; 5) A sense-making process that allows the transformation of raw performance data into performance information; 6) A process of dissemination of performance information among system actors and stakeholders with the intent of making it actionable; 7) The adoption of performance information (use, misuse or non-use) by system actors and stakeholders (a proximal outcome); 8) Implementation of planned action; and, 9) Other intermediate and distal outcomes derived from the implementation of clinical and/or managerial improvements including process and quality improvements; and population-level health and equity outcomes.

The relationship between system elements above, generate inter-dependencies that lead to non-linear effects, delays, and feedback. System actors' agency and their interactions with the context are sources for such system behaviors and contribute to the PMM system's short- and long-term outcomes. The production and accumulation of desirable social and health effects will require continuous repetition of the cycles of measurement, performance information adoption, and implementation for organizational learning and improvement to occur and, particularly, for the sustaining of performance improvements through time.

The Salud Mesoamerica Initiative (SMI)

SMI is a results-based, health system-strengthening initiative that provides funding to participating governments for the achievement of population-level outcomes in reproductive, maternal, neonatal, and child health³⁵. Participating governments agree with the Inter-American Development Bank (IADB) to implementing up to three consecutive 24-month phases, aimed at achieving a series of progressively complex health targets. Country performance frameworks target the poorest, hardest-to-reach municipalities and have an initial focus on inputs and processes, while progressively prioritizing health outputs and outcomes.

Governments contribute domestic funds *a-priori* and SMI matches these contributions with grant financing. In the contract

between SMI and the government, the former commits to reimbursing half of the initially invested domestic funds contingent on the achievement of the agreed-upon performance targets³⁶. A supply-side financial incentive was established, according to which a government has to achieve 80% or more of the targets in its performance framework to be eligible for the reimbursement of half of the initial domestic contribution.

Box 2. Performance measurement and management intervention and outcomes

The three main categories of performance-inducing interventions are:

Implementation strategies, such as, in-service training; supervision; continuing education; clinical practice guidelines; reminders; clinical incident reporting; local opinion leaders; continuous quality improvement.

Accountability arrangements, including audit and feedback; public release of performance information; social accountability

Financial arrangements, such as performance-based financing (including supply-side results-based financing); pay for performance and other provider incentives (in-kind and financial)

Potential outcomes from the interventions above include:

Provider and managerial outputs and outcomes, such as workload; work morale; stress; burnout; staff turnover; sick leave; absenteeism

Patient outcomes, including health status outcomes; health behaviors; unintended patient outcomes

Organizational outcomes, such as quality of care and process improvements; adherence to recommended practice guidelines; patient satisfaction; perceived quality of care; workforce retention; changes in organizational culture; unintended organizational outcomes

Population health outputs and outcomes, such as utilization of services; coverage of interventions or services; access to primary care services; health equity effects; adverse health effects or harm; unintended population health outcomes

Social outcomes, like community participation; equity effects; unintended social outcomes

SMI's Salvadorian phase 2 program include interventions that are common to all participating countries and, also, unique PMM interventions. Of relevance to this evaluation was the inclusion of an in-kind, team-based incentive program implemented between 2015 and 2017, and involving the 75 Community Health Teams (CHTs) participating in SMI.

Participating CHTs agreed to a set of eleven (11) maternal, neonatal and child health targets, linked to the performance framework agreed between SMI and the Ministry of Health (MOH). CHTs that succeeded in achieving 80% or more of their performance targets were eligible for an in-kind incentive from a list of pre-established goods valued at up to \$1,000. The payment rule was based on a sliding scale, with the awards varying depending on the number of targets achieved.

A cluster-randomized impact evaluation was conducted to experimentally evaluate the effects of in-kind incentives on CHTs

performance³⁷. SMI collected household and facility survey data every six months. Results from the impact evaluation will be published separately by the IADB. In response to SMI's measurement of CHT performance, the MOH increased its own internal processes for CHT performance verification and supervision. The collection and analysis of performance proxies became a continuous process, and the regular monthly meetings between regional MOH offices and CHTs became a routine source for data analysis, internal accountability, action planning, and course-correction.

Performance results from the four waves of impact evaluation data collection were disseminated every six months, among all CHTs participating independent of experimental assignment. Specially convened meetings were hosted by the MOH and attended by central- and regional-level officers from the MOH, CHT coordinators, and SMI experts.

Program performance is externally verified by the University of Washington's Institute for Health Metrics and Evaluation (IHME) at baseline and before the finalization of each phase. IHME uses quantitative measures of performance obtained through household and facility surveys³⁸. After each round of performance measurement, results are aggregated and disseminated in each country through dialogue workshops involving the government, IADB and IHME. Further information about SMI's original design and theory of change can be found in the evaluation protocol³⁹.

Having consistently achieved its performance targets, El Salvador's SMI program has been a major success to date. As a result, the MOH has received financial incentives for \$2.6 million in phases 1 and 2. [Table 1](#) lists targets and the results obtained to date.

Study setting

El Salvador is a low-income country in Central America. According to the World Bank, annual real growth in gross domestic product (GDP) was 1.9% in the period between 2010 and 2016, the lowest in Central America. Since the end of the civil war in 1992, El Salvador has made continuous progress in human development, increasing access to public services among the poor, reducing inequality by about 5 percentage points between 2007 and 2016, and increasing income in the lowest income quintile⁴⁰. Health indicators have also shown major improvements in the last decade with institutional deliveries and immunization coverage reaching 98 and 93%, respectively. Sustained pro-poor social policies in the country helped the country achieve Millennium Development Goal #4 (MDG 4) for under-5 mortality reduction⁴¹. Also, El Salvador is one of twenty countries undertaking accelerated implementation of the 2030 global agenda for the Sustainable Development Goals.

In 2009, the government of El Salvador reformed the public health system by introducing changes to the Ministry of Health's (MOH) model of primary care delivery. Existing facilities were reorganized into integrated networks of healthcare delivery; free

Table 1. El Salvador, performance framework and results to date.

Indicator	Baseline 2011 (% and confidence interval if applicable)	Phase 1 target (C.I.)	Phase-1 result 2014	Phase 1 Score	Phase 2 target (C.I.)	Phase 2 result 2017	Phase 2 score
Number of Family and Specialized Community Health Teams (CHT) established	37	68	59	0	-	-	-
Number of families ascribed to Family CHTs	14,681	38,661	59,495	0.1	-	-	-
Number of CHTs with required inputs for antenatal care	48% (35-62%)	68	98% (90-100%)	0.1	-	-	-
% of CHTs with stocks of four family planning methods (injectables, barriers, oral contraceptives, and intrauterine devices)	19% (10-31%)	65	92% (81-98%)	0.1	-	-	-
% of CHTs with the required inputs for infant care	36% (24-50%)	58	92.2% (81-98%)	0.1	-	-	-
% of CHTs with refrigerator or cool box for proper vaccine storage	43% (29-57%)	65	78% (65-89%)	0.1	-	-	-
Introduction of a national policy for the distribution of powdered micronutrients for children aged 6–23 months	No	Yes	Yes	0.1	-	-	-
Issuing a regulation for the adequate dosage of therapeutic zinc for the treatment of diarrhea in children of less than 5 years (20 mg of Zinc during 10–14 days in each diarrheal episode).	No	Yes	Yes	0.1	-	-	-
% of pregnant women recorded in the antenatal registry that had antenatal care performed by a medical doctor or a nurse before 12 weeks.	67	77%	64.9% (59-71%)	0	-	-	-
% of children less than 1 year registered in the health information system in less than 8 days after birth	51	61	90.1% (87-93%)	0.1	-	-	-
% of children 6–23 months with hemoglobin levels < 110g/L	47% (44-50%)	N. A.	-	-	36.5%	47.3% (36-59%)	0.1
Modern contraceptive use	53.9% (51-57%)	N. A.	-	-	60.5%	75% (70-79%)	0.1
% of antenatal care visits with quality	N. A.	N. A.	-	-	62.5%	63.9% (58-70%)	0.1
% of antenatal visits during the first trimester	N. A.	N. A.	58.7% (51-66%)		62.5%	63.9% (58-70%)	0.1
Most recent delivery in the last 2 years, as institutional delivery, and attended by skilled personnel	85.7% (82-88%)	N. A.	-	-	94.2%	98.3% (96-99%)	0.1
%Postpartum visit one week after delivery	81.2% (78-84%)	N. A.	-	-	91.6%	62.6% (53-71%)	0
% Children 12–23 months immunized with measles vaccine, according to vaccination card	65.5% (61-70%)	N. A.	-	-	73.6%	91.1% (83-95%)	0.1

Indicator	Baseline 2011 (% and confidence interval if applicable)	Phase 1 target (C.I.)	Phase-1 result 2014	Phase 1 Score	Phase 2 target (C.I.)	Phase 2 result 2017	Phase 2 score
% Children 12-59 months who received two doses of anti-helminth medications during the last year	36.2% (33-39%)	N. A.	-	-	56.4%	40.5% (35-46%)	0
Mothers that provided oral rehydration salts and zinc to their children in the last episode of diarrhea	4.5% (3-7%)	N. A.	-	-	24.4%	33.7% (21-49%)	0.1
Full birth plan at CHTs (second delivery)	N. A.	N. A.	-	-	70%	86.3% (82-90%)	0.1
Total score (A score of 0.8 or more triggers a financial incentive or performance tranche for the MOH)	-	-	-	0.8	-	-	0.8

Source: IHME and IADB

services were introduced; and the provision of comprehensive primary care services through Community Family Health Teams (CHT) became the central mode of service delivery. Rural CHTs include a medical doctor, two nurses, and three community health promoters with a nominal catchment of 3000 individuals for the entire primary care team. CHTs identify, enumerate and assess risks in their assigned catchment areas and are responsible for providing a package of approximately 300 primary care-related interventions such as health promotion, prevention, and treatment of common conditions⁴². By the end of 2015, El Salvador had established 747 CHTs. In El Salvador, SMI started implementation in 2011 in 14 of the poorest rural municipalities where 75 CHTs operate. Table 2 provides details about the linkage between the PMM framework and the SMI program in El Salvador.

Methods

Methodological approach and study design

This study used a realist evaluation approach, which provides a valuable standpoint for evaluating policies and programs that attempt to introduce changes in complex adaptive social systems^{43,44} such as a PMM system⁴⁵. Realist evaluation is a type of theory-driven inquiry based on the premise that an evaluation needs to answer, “*what worked, how, in what circumstances, and for whom*” complementing the more conventional evaluation question “*Did the program work?*”⁴³. The rationale for using a realist approach in this study was described in a previously published study protocol³⁹. The appeal we saw in realist evaluation, compared to other possible approaches is its explicit foundations in critical realism, an epistemology that contends that the interactions between context and program interventions generate change through the triggering of underlying, usually hidden, causal mechanisms.

To characterize high-performing primary care systems at scale, we purposefully identified and studied positive outliers, a methodological approach that “can reveal a great deal about intense

manifestations of the phenomenon of interest”⁴⁶. Such study design also aligns well with the realist evaluation proposition that contexts can trigger to-be-identified mechanisms that, in turn, interact with program interventions and contribute to generating outcomes at various levels.

This paper reports the results of an ongoing evaluation that is concurrent with the implementation of SMI’s second and third phases. The research questions addressed here are: (1) What are the effects of using supply-side incentives at the primary care delivery level, on the performance of the primary care delivery system? How are those effects produced? Under what contextual conditions? And, (2) What are the effects of high-stakes external measurement on performance itself? How are those effects produced? What contextual factors contribute or hinder those effects? In this paper, we report program effects only from the perspective of CHTs; policy-level perspectives will be presented elsewhere.

The steps followed in this evaluation were detailed in the study protocol³⁹. They included, first, the development by the research team of a preliminary program theory (PT), followed by the identification of the research methods best suited to test and revise the preliminary PT. Data is then collected and analyzed; the process ends with a synthesis of findings and the generation of a refined PT. Each of these steps will be briefly described below.

Preliminary PT development

The preliminary PT (Figure 1) that underpins this evaluation shows hypothesized causal linkages between context, SMI’s interventions, causal mechanisms, and program outcomes. The initial PT resulted from a scoping review of the literature on PMM and public sector motivation^{9,18–20,23,24,28,47,48}, performance information utilization^{29,49–53}, diffusion of innovations theory applied to health services delivery^{54–58}, socio-cognitive theory^{59–61}, self-determination theory^{62–71}, neo-institutional theory^{72,73}, and recent

Table 2. SMI interventions by level of implementation in El Salvador.

Framework component	Central-level of the Ministry of Health	Local-level (Primary care delivery system in 75 municipalities)
1- Institutional and policy context (policies, programs and activities) and primary care system actors and stakeholders	Health reform of 2009 (comprehensive, integrated primary care); Health policy priorities (maternal, neonatal, and child health); focus on equity and poverty reduction.	Model of care emphasizes integrated delivery of primary care through community health teams embedded in the municipalities they serve; free of charge services; and, community participation.
2- Local socio-economic context	Geographical targeting of the poorest municipalities in the country.	Rural, hard-to reach communities; extreme poverty; prevalent security and violence;
3- Performance measurement and management interventions	External verification of country program performance; and, supply-side incentives to the MOH through results-based financing.	During phase 2, introduction of community health team-based, in kind incentives.
4- Performance measurement	IHME collects household and facility-based surveys across the country every 24 months.	A randomized-controlled trial to evaluate the impact of the in-kind incentives measured CHT performance. Household and facility-based surveys collected in all 75 participating CHT every 6 months for 2 years.
5- Sense-making process (turning data into information)	SMI, IHME and the MOH defined criteria for data analysis and synthesis.	SMI and the MOH defined data collection and analysis methods. A set of 10 performance targets included in each CHT performance framework.
6- Dissemination of performance information	Results presented every 24 months in meetings attended by policy-makers, SMI and IHME. Achievement of 80 per cent or more of the agreed-upon targets triggers a performance payment (50 per cent of the government's financial contribution to SMI).	Results presented every 6 months in meetings attended by medical directors of participating CHTs (treatment and controls alike). Awards and in-kind incentives presented to CHT achieving 80 per cent or more of the agreed-upon targets.
7- Adoption of performance information (use, misuse or non-use)	Performance information used in support of the design of the subsequent SMI phase.	<i>Unknown. To be characterized during the evaluation.</i>
8- Implementation	<i>Unknown. To be characterized during the evaluation.</i>	<i>Unknown. To be characterized during the evaluation.</i>
9- Outcomes	El Salvador has successfully achieved 80 per cent or more of the agreed-upon targets for SMI's phases 1 and 2.	<i>Unknown. To be characterized during the evaluation.</i>

evidence on the performance and motivation of frontline workers in LMIC^{10,74–76}. Additional information was obtained through SMI documents review and a program stakeholder workshop held in early 2017. The preliminary PT is described in detail in the study protocol in [Box 1](#)³⁹. [Table 3](#) provides a summary of the data sources used to address specific elements of the preliminary PT and a general schematic of the sequencing and timing of the evaluation components.

In a work environment, motivation is defined as an “individual’s degree of willingness to exert and maintain an effort towards organizational goals⁷⁶.” Highly motivated workers report higher levels of job satisfaction, which can lead to lower levels of health worker attrition, ultimately contributing to the retention and continued presence of skilled and experienced workforce in a health system. Motivation can be instrumental or *extrinsic*, driven from contingent rewards (both financial remuneration and non-monetary recognition), or *intrinsic*, driven from an

individual’s inherent desire to perform a task for its own sake^{77,78}. Usually a combination of these two facets determine an individual worker’s motivation to perform.

Research in economics, psychology, organizational behavior, and public administration, among other fields, assume that incentives and rewards serve as powerful motivators for the achievement of desirable behaviors among utility-maximizing, rational individuals^{79,80}. This approach has fueled the design of various accountability-driven interventions and many interventions. Many public-sector reforms in LMICs and various global health partnerships have been influenced by this approach. However, theoretical and empirical developments in public administration research suggest that workforce motivation can also be explained by intrinsic motives such as public service motivation, a socially learned set of preferences that can be present among individuals working in the public sector^{9,81}. To characterize workers behaviors in primary care settings in LMICs, we

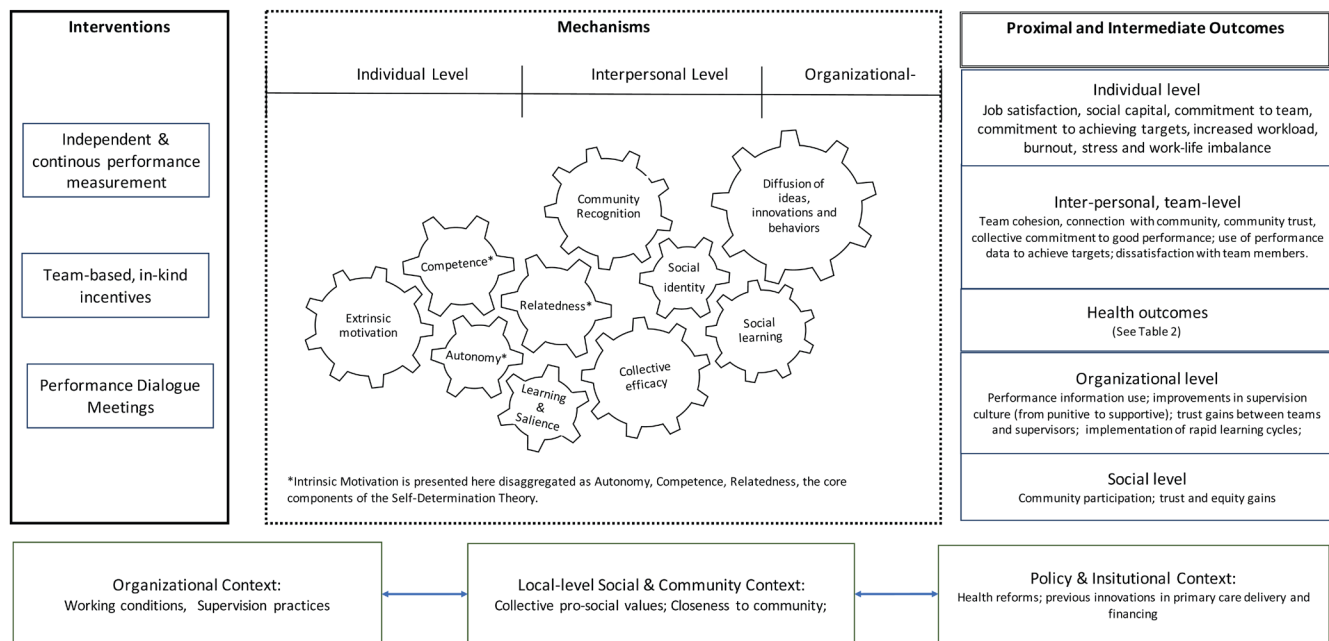


Table 3. Sources for and timing of the development of the preliminary PT and data collection.

Preliminary PT components and domains of interest	In-depth interviews (July-November 2017)	Non-participant observation (May 2018)	Stakeholder workshop (March 2017)	Document review (Ongoing)
Contextual factors				
Institutional and policy context	√			√
System antecedents				
Organizational environment				
Interventions	√		√	√
Mechanisms				
Individual and inter-personal motivation	√			
Collective-level mechanisms (network effects)				
Outcomes				
Non-health effects	√	√	√	√
Health effects				

focused on the theory of self-determination, a macro theory of human motivation that has been used to study motivation in the workforce including in a previous realist evaluation in Uganda^{67,71}. The theory has good cross-cultural validation and has demonstrated that individual workers who satisfy internal needs for competence, autonomy and relatedness feel intrinsically motivated and can develop self-motivated behaviors^{66,82–84}.

Data collection methods

As detailed in the protocol³⁹, realist evaluation is method-neutral. The methods that optimally addressed the evaluation questions that this paper focuses on, under real-world operational

constraints included: document review, key-informant interviews, and non-participant observation. We used a purposeful, outlier sampling⁴⁶ in which a case is defined a top-performing CHT in the SMI phase 2 program in El Salvador. For the purposes of this study, we selected positive outliers, namely the top four (4) performing CHTs as identified by independent performance measurements conducted by SMI in September 2015; March 2016; September 2016; and February 2017.

Interviews were conducted with MOH policy and program experts, and with providers of care in the four participating CHTs (doctors, nurses and health promoters). To acquire information about SMI's design, implementation and evaluation not

likely to be apparent from program documents, we also interviewed IADB and IHME experts. A total of 38 in-depth interviews were conducted between July and November 2017. Interviews were conducted by one member of the research team while a second investigator acted as observer. Table 4 summarizes the profiles of the respondents.

Specific issues addressed in CHT interviews included, (1) Respondent perceptions of the SMI interventions under study; (2) Emotional and cognitive reactions triggered by the use of MOH-level financial incentives, in-kind team incentives, and external measurement of CHT performance; (3) Knowledge of, and perceptions about, context-specific factors that hinder or contribute to workers individual and team-based behaviors; (4) Descriptions of program ancillary components that could explain program effects; and, (5) Unintentional and undesirable effects. Interview guides were published with the study protocol³⁹.

Information about the dissemination of results from the external verification of performance was obtained by observing IHME's presentation of results of overall program performance measurement at the end of SMI's second phase. One of the authors (CI) attended the workshop that took place in El Salvador during May 2018.

Data analysis

Interviews were first transcribed verbatim in Spanish and were then translated into English. A predefined coding system based on the preliminary PT was developed *a priori* and used for coding by three of the authors (WM, SW and SM) using NVivo 12. Inductive codes also emerged from the data, further enhancing the coding process. Context-Mechanism-Intervention-Outcome patterns across interviews were synthesized into themes using analysis memos that identified salient domains and recorded exemplary quotes.

We used several criteria to identify emergent themes. First, the frequency of respondents' perceptions was the starting criterion to identify salient areas; these were consolidated as themes based on their relevance and importance to the study questions and preliminary PT, through discussions and consensus-building among the researchers. We also merged the perspectives shared by central-level policy-makers with the accounts shared by frontline workers to compare, contrast, and ultimately converge

perspectives from these two organizational levels of the health system.

Once thematic analysis was completed, the themes emerging from the transcripts were arranged in tables according to their reference to context, interventions, causal mechanisms, and outcomes identified by each individual respondent. We used the resulting tables to identify hypothetical Context-Mechanism-Intervention-Outcome configurations that could plausibly explain the observed program results. Findings were also triangulated by considering data from different sources (IHME external verification data, the results from CHT performance measurement, observation notes, and secondary document analysis). The refined PT was synthesized as narratives and figures. Additional details about the data analysis strategy were included in the study protocol³⁹.

To increase the validity of the study in terms of reflexivity, credibility and confirmability, and to enhance the trustworthiness, transparency, and accountability of the research, investigators maintained 'personal biases memos' that made explicit all self-identified biases and pre-conceptions that may have effects on the research process⁴⁵. Also, all analytic decision notes and memos, biases memos, document analysis syntheses, interview guides, research team meeting agendas and minutes, and analysis outputs including coded transcripts, conceptual frameworks, and tables have been preserved to provide a verifiable audit trail.

Ethical considerations

The study's protocol was reviewed and declared exempt by the George Washington University's Institutional Review Board (study number 041733). The Ministries of Health of El Salvador and Honduras were informed of the proposed research by the IADB and provided written approval for the research activities.

Respondents were given the choice to provide consent verbally on tape before the interviews, or in writing. To maintain anonymity, respondents reserved the right to review the study outputs and withdraw consent if necessary.

Results

Study findings are presented in three sections: the context; the mechanisms; and, the context-mechanism-outcome configurations. We then summarize the refined PT.

Table 4. Profile of interview respondents.

Type of respondent	Number of in-depth interviews	Women	Men
Community health team members	13	8	5
Central-level policy-makers	8	6	2
IADB experts	11	4	7
IHME experts	6	3	3
<i>Totals</i>	<i>38</i>	<i>21</i>	<i>17</i>

Context

Based on the evidence from the achievement in the four high-performance CHTs sampled, several contextual factors appear to have been conducive to the successful implementation of SMI in El Salvador.

The convergence of domestic political and policy priorities, a conducive global environment, and SMI's focus on performance measurement created a unique window of opportunity for country ownership to take hold. The election in 2009 of the first-ever, left-wing President in El Salvador generated a favorable political environment for SMI implementation. The incoming administration's priorities opened a window of opportunity for institutional reforms in the health sector, leading to the formulation of new rules for increasing affordability, equity, access, and coverage of publicly provided health services and to the scaling-up of comprehensive primary health care services in the poorest municipalities in the country. Central to this process were the enhancement of the supply of public services through CHTs and the introduction of free primary care services.

Upon SMI launch, the MOH internal organizational environment was characterized by a positive tension for change and a sense of urgency. The Salvadorian reform's focus on primary health care delivery and SMI's pro-performance stance supported the perception at high-levels that the government's and SMI's priorities were strategically aligned. This was particularly evident in areas such as targeting the poorest rural municipalities, improving equity gains, and expanding coverage for maternal, neonatal and child health services. These factors may have also provided a positive tension for change and a sense of urgency on the part of the government, leading to their full engagement with SMI and agreement to attempt the achievement of high-stakes performance targets. The global focus on achieving the Millennium Development Goals further reinforced SMI's and the Salvadorian government's high priority for maternal and child health.

SMI implementation leveraged existing MOH structures, practices and routines, increasing country ownership and generating complementarities between SMI implementation and the MOH's internal environment. Since SMI has been implemented directly by the MOH, the program has leveraged existing MOH administrative and managerial systems. For example, the MOH has a long-standing tradition of hosting regular, monthly meetings among primary care stakeholders (e.g., regional offices and CHTs) for supervision and coordination purposes; these meetings were also regularly used to transmit top-down instructions and directives. These routines were adopted and adapted by the MOH and SMI and transformed into continuous, ongoing spaces for performance dialogues, a central aspect to SMI's approach.

SMI implementation exposed weaknesses in MOH management systems early on, which have been reduced during implementation and no longer hinder CHT performance. Early failures in supply management and logistics led to

stock-outs that negatively affected CHTs' ability to perform. Such experiences led to the identification and explicit discussion of the inter-dependencies between CHT performance and health system deficiencies. Improvements in administrative processes ensued and stock-outs and poor availability of supplies were addressed.

Mechanisms

Causal mechanisms are defined as the actions and reactions, or behaviors, triggered among program actors by the interactions between the context and SMI's interventions. Extrinsic and intrinsic motives serve as mechanisms for transforming individual and interpersonal behaviors among CHTs and other stakeholders. The mechanisms hypothesized in the preliminary PT, can be positive sources of motivation as well as negative, balancing causes of de-motivation. Table 5 presents exemplar quotes about the mechanisms identified.

Positive sources of individual motivation (extrinsic and intrinsic). Our results suggest that the Salvadorian reform and SMI's pro-performance stance may behave as complementary sources of positive, intrinsic motives as well as external drivers of performance, respectively. Furthermore, findings suggest that the intrinsic motivation for joining CHTs are complex and may therefore be triggered by different motives and preferences. When asked about their reasons for working at the community level, CHT respondents identified the acquisition of a sense of competence and the satisfaction of a desire for providing public services, while also acknowledging the benefits from wages and job security.

Extrinsic motives play an important role for individual CHT members who recognize the inherent value of public-sector job security. The joint effect of extrinsic motives like salary, job security and the SMI-specific in-kind incentives for CHT was important for all respondents. A desire for additional bonuses and other forms of external recognition was reported by the majority of CHT respondents.

All frontline workers interviewed expressed a sense of commitment and sacrifice to the communities they serve; to the health of families in their catchment area; and to the achievement of their collective, CHT-specific performance targets. Such degree of commitment plausibly indicates the existence of high levels of intrinsic self-motivation among CHT members that may operate at individual as well as interpersonal levels. Work as a front-line, primary care provider satisfies for most respondents one or more of the following: a sense of competence in their abilities and skills; a sense of autonomy in executing their tasks; and a sense of relatedness to their colleagues and the communities they serve.

Credible data support the qualitative findings regarding commitment and positive motivations expressed by CHT respondents. These include CHT-specific performance information collected by the MOH on monthly cycles of measurement, and the analysis and action-planning reinforced by SMI interventions

such as quarterly supervision visits; regular focusing events where teams' performance is reviewed between CHTs, the MOH, and SMI; and, high-level dialogue meetings where MOH, SMI and IHME discuss the results of the external measurement of system-wide performance.

An intrinsic motive frequently expressed by respondents is the sense of competence obtained from accomplishing their team tasks and thus being able to verify for themselves positive effects on local beneficiaries. Physical and emotional closeness between front-line workers and the community in which they live, come from, and serve, likely increases their social identity and the significance of their jobs, fulfilling a sense of competence and relatedness, which can contribute to the expressions of job satisfaction that emerged frequently in the interviews.

Team-based, interpersonal-level motivation. Our findings suggest that team-level mechanisms play a major role in modifying interpersonal motivation and supporting team cohesion. CHT

respondents recognized that SMI introduced major, and positive sources of team motivation. One of the most valued sources of motivation was the sense of contribution, collaboration, and relatedness to other CHTs that was found through the convening of regular performance dialogue meetings. Furthermore, respondents reported a sense of team-based, collective efficacy mediated by the Salvadorian reform requirement that CHTs engage local communities in developing their annual operating plans as well as in accounting their performance results. These are sources of inter-personal or team-based motivation, as the effects they trigger can only be accounted for by collective actions executed by the entire CHT. Such mechanisms are reinforced by the sense of trust that communities develop in high-performing CHTs, thus increasing their members' individual and team-based social status.

Furthermore, PMM interventions and ancillary components introduced by SMI are implemented in within- and between-teams' social environments such as ongoing, internal team

Table 5. Mechanisms, selected quotes.

Mechanism	Exemplar quotes
Positive sources of individual motivation include: Extrinsic sources of motivation: <ul style="list-style-type: none"> - Wages and benefits - A sense of job security in a public sector organization - Team-based incentives Intrinsic sources <ul style="list-style-type: none"> - Sense of competence, in completing tasks and succeeding at what they do - Sense of relatedness, to community and other team members - Sense of autonomy when planning executing team goals 	<p>As one health promoter notes: <i>"Well, in the first place I needed to work. And I liked this. I had about five years of experience working in the rural area. And when I had the opportunity of getting a job in the Ministry, (...) it was easier for me because I knew about community organization (...), and about community work."</i></p> <p>A team member reported: <i>"The salary is something symbolic. The benefits and the employment are guarantees. There are guarantees. You have to value that."</i></p> <p>A community health team member highlighted: <i>"In the case of Mesoamerica there is a specific organization of the indicators that you're going to work with; no doubt with staff sacrifice. Because this implies a high amount of work. It's true. We do have good indicators. But it is also a great human sacrifice on the part of the staff to achieve it. And the staff also makes a commitment."</i></p> <p>A participant described the emotions triggered when positive performance was recognized at high-stakes performance dialogues: <i>"To have that kind of profound reaction of satisfaction with yourself for the work you do; when you feel that satisfaction you feel it deep inside. It is because there is an answer to something that I'm doing; that motivates me."</i></p> <p>A health promoter reported: <i>"We don't have a work shift. They may call us in the middle of the night if there is a pregnant woman. We say: 'We're going on the ambulance right away.' But if there are no ambulances available, we have to find a plan B so that she can get in time to give birth in the hospital. So, our satisfaction is that we have accomplished our mission of fulfilling our people's needs."</i></p> <p>Participating in high-stakes focusing events trigger deep emotions when successful performance is publicly recognized: <i>"When we go to the meetings, and I love that.... when we are all there, they say, 'We are going to give this diploma to the teams that made a great work.' They call them up, and it looks like they are graduating from something. And my colleagues become really motivated. And maybe you can hear from those who didn't receive anything phrases like 'I will propose something for the next meeting because I want to be there.'"</i></p> <p>Being recognized with the team-based in-kind incentives is reported as: <i>"That's like a bonus for what we were already doing. So, let's try harder. Since they are recognizing our work, and they want to recognize it, well, then it was like a motivation, an extra incentive to strive more, right? To work."</i></p> <p>A doctor reported: <i>"I feel important. I definitely feel important. I'm important for this institution because of my work. I feel satisfied and proud of what I'm getting, because they have even given written acknowledgments under my name, and I feel very important."</i></p>

Mechanism	Exemplar quotes
<p>Team-based, interpersonal-level motivation</p> <ul style="list-style-type: none"> - Team efficacy - Inter-team learning and knowledge-sharing - Community recognition - Closeness to communities - Social capital and trust 	<p>A health promoter stated: <i>"We have our accountability too. At the beginning of the year, we present our annual operational plan. So, the community knows about the work we will be doing. What's the plan; what the intervention plans in the community are about. In the last quarter, between October and December, it is mandatory the submission of the accountability. 'Look, we've achieved this. In this community you helped us with this, the population. We were able to do this, we still have to do this, and these are our weaknesses.' So, in that way we are improving."</i></p> <p>A participant in an inter-organizational meeting of CHTs described the dynamics that occur: <i>"For example, with the other teams in <masked> and <masked> it was like a challenge. The incentive is a motivation to reach the goal, right? Because I am getting recognition. It can be a public acknowledgment, it can be an acknowledgment in terms of resources for the team itself. So, that was a challenge for them too. They took it well. In fact, both teams sat together. They designed their own strategy to quickly achieve the indicators. It even motivated them to work, to create ideas, strategies, and to look for them."</i></p> <p>Regarding the usefulness of performance dialogue, a participant reported: <i>"They are very helpful. It is also a recognition. Because we are taken into account; and they say 'Hey, you have achieved this before the rest who have not yet succeeded. Share this. Share your experiences the strategies.' Well, for one, they are taking us into account and we are important. We are someone who can be a leader. And we are relating to others, and of course that makes us feel proud."</i></p> <p>A medical director described the team common motivation for working at the community-level: <i>"How the team has been transformed! The team that works on the same objective. And is available and if necessary on a weekend. My purpose in life is clear, right? So, we are here to help. And this is it! It has been the best opportunity to prove that. My purpose is to serve."</i></p> <p>A medical doctor reported: <i>"We have meetings where we present all the results at the regional level. For example, we go to the meeting. I see it more as an issue of sharing experience with peers. But for us in <municipality masked> in the department of <masked>, we present the results. But I don't see that we compare ourselves to others. It's more about what things are we doing well, and what things they can do well, and what things can we learn from other peers."</i></p> <p>A team member discussed external recognition: <i>"Anyone who sacrifices himself and tries hard, needs to be recognized for the work. And work that is done every day. That was an extra motivation for everyone. For the teams; that they said they were going to be recognized for their performance, only."</i></p> <p>A health promoter commented: <i>"Well, I know those people. They may be my relatives, friends, neighbors. So, that's a key element to the improvement of the health conditions in the population. That's what makes you feel, in many cases, empowered and able to gather the courage, regardless of each person's personal situation."</i></p> <p>Relations between the team and community members are described by a team member: <i>"I think we are a part of their family, because we are already recognized, we are constantly in their homes, especially where there are children under 5, pregnant women, older adults. We are closer to them and they don't... that is, they recognize me, and the promoters of course, they nurses also. "</i></p> <p>A policy-maker commented: <i>"Truly, the health staff in these towns over here, they're like a fictional character, really. A character they recognize, you see? And you can be recognized if you do well when it comes to delivering the work; you do your job well. And this recognition translates into unconditional support towards your efforts, they help you with every one of the tasks you're going to do..."</i></p> <p>A community health team member stated: <i>"You work closely with local organizations, and that makes your job easier. For example, when you go to vaccinate, it's not the promoter that goes there alone with his thermos. The health committee itself, the women's committee say, 'Get me a bag and we'll start a cleaning campaign.' Or, 'Let's pick up the trash in order to prevent diseases in this area.' That makes the promoter not being alone in the community. He has to have that support, so his job becomes easier at the community level."</i></p>
<p>Potential sources of demotivation</p> <ul style="list-style-type: none"> - Poor work-life balance - Dissatisfaction with lack of supplies - Stress and anxiety 	<p>A front-line worker commented: <i>"You may have problems with your family, or economic problems. There may be problems related to the weather. And in community health, we say that we are 24/7. Like ATM machines."</i></p> <p>A respondent indicated: <i>"Another thing is to find, for example, that you don't even have a car to go fetch a patient with. Or you don't have things to give them (patients). This happened to us in the first measurement. We had no oral rehydration salts, we had no zinc, no micronutrients for five months! We ran out of everything! And three indicators failed. But that is not up to us. It's up to the regional health office. I can't be measured if I don't have these (supplies)."</i></p>

meetings in each facility, and external learning events convened by SMI and hosted by the MOH. CHTs from different geographical areas get together to learn from each other, share knowledge and experiences, and design improvement plans. The data suggests that such group dynamics can help CHTs make sense of the performance data, leading to the actual utilization of performance information to plan improvements and process innovations. It is thus plausible that these dialogue spaces among peers may trigger social learning mechanisms and set the basis for the organic diffusion of ideas, innovations and behaviors.

When describing the reasons why they enjoy working for their communities, CHT team members consistently reported a sense of empowerment, commitment, team efficacy, and community service. The closeness between team members and beneficiary communities is also a source of inter-personal motivation. Highly-effective CHTs can attain a degree of social recognition that may only be possible in community-embedded teams. Furthermore, for individuals with high levels of public service motivation, energized by fulfilling their sense of competence, autonomy and relatedness, social recognition may further reinforce their intrinsic, pro-social attitudes.

Potential sources of de-motivation. Despite their strong motivation, CHT members oftentimes work against their own personal interests even when this generates undesirable effects for themselves or their families. A frequent theme when describing the challenges of providing outreach services is one of sacrifice which may be both a source of stress as well as an internal drive to help others.

Performance measurement also triggered feelings of stress and anxiety particularly during the early stages of SMI implementation when, according to CHT respondents there were shortages of supplies and other inputs required for meeting CHT performance targets. Also, while respondents in all four CHT reported participating in, and being energized by their involvement in meetings and learning activities, their responses indicated certain preferences and dislikes. For instance, the least appealing activities for many respondents were those that required inter-team comparisons, poorly-delivered feedback by supervisors, and meetings where differentials in goal achievement among CHTs were publicly highlighted.

Refined Program Theory

We identified plausible causal linkages between the relatively small, but well-targeted supply-side incentives brought by SMI at the central level of the MOH; the high-stakes generated by SMI's measurement of CHT performance every six months; and in-kind, team-based incentives. Findings suggest that SMI interventions and ancillary components; the dynamic institutional environment generated by the health reform; and, the socio-economic contexts in which Salvadorian front-line workers operate, contributed to triggering intrinsic and extrinsic motivation in the four high-performing CHTs studied. Such gains in motivation appear to have been built upon high levels of

pre-existing public service motivation among front-line workers and on extrinsic motives such as wages and the expectation of job security and promotions. The introduction by SMI of performance measurement and in-kind, team-based incentives, appear to have reinforced self-motivation among individual team members, also contributing to the generation of team-based motivation.

The learning events scheduled during SMI implementation created a space in which front-line workers, mid-level managers, MOH policy-makers, and SMI staff engaged in enriching performance dialogues and learning and knowledge-sharing. This may have generated several effects. First, it may have focused the attention of CHT and other system actors on making sense of performance data and using performance information to plan future improvements. These behaviors may have also been reinforced by 1) the pro-social, other-oriented and intrinsic satisfaction derived from the sense of competence, autonomy and relatedness described by community health team members; 2) the external motivation triggered by in-kind team-based incentives; and, 3) the extrinsic and powerful incentives generated by increased community recognition and social stature among front-line workers. Second, performance dialogue meetings may have also created safe inter-organizational spaces where social connection, learning, and knowledge-sharing could happen. Finally, these meetings acted as focusing events where high-performing teams were recognized and rewarded, and where dialogue across MOH organizational levels created opportunities to change internal conversations between managerial and operational actors, from conventional top-down control, towards emergent horizontal and, possibly, bottom-up performance management and organizational learning activities. Were this last to be sustained through time, it could set the basis for the emergence of a culture of autonomous, self-directed improvement among CHTs, further reinforcing the positive motivational mechanisms described above.

Our findings identified elements that were not originally included in the preliminary PT that enrich the emerging, refined PT. First, the PT identified theories of human behavior and motivation that were mostly focused on individual-level motives, such as social-cognitive and self-determination theories^{59,61,65,82,83}; it also highlighted interpersonal mechanisms mostly transmitted through diffusion and social learning channels. Second, despite the mention of unintended or negative outcomes in our preliminary PT, the evaluation protocol did not expand on what those effects could be, except as it pertains to gaming, shirking and other negative effects.

The refined PT (Box 3 and Figure 1) now includes team-based motivation as a specific type of interpersonal motivation, informed by collective efficacy theories⁸⁶ as well as by theories of identity⁸⁷ and social identity^{88–91}. The refined PT also contains unintended, demotivating effects that PMM interventions could induce in frontline workers such as stress, anxiety, and poor work-life balance.

Box 3. Refined program theory as a context-mechanism-intervention-outcome configuration

In *contexts* where primary care teams and beneficiaries are in close proximity, where front-line workers have high levels of public service motivation, and where primary care provision is embedded in organizational environments that provide job security, wages, and opportunities for promotion; continuous support in the form of appropriate working conditions and supplies; that offer opportunities for recognition linked to providers' performance; where supervision is supportive and includes actionable feedback; and where the domestic policy and institutional context provides autonomy and clear mandates for the delivery of primary care services;

Where program *interventions* include, in kind, team-based incentives; independent, rigorous, continuous team-based performance measurement; and, continuous, inter-organizational (i.e., inter-team) and intra-team, performance dialogue and other focusing events that raise the stakes and make performance results visible for providers and communities; the following *mechanisms* can be triggered:

- At the individual-level – the satisfaction of a sense of competence, relatedness, and autonomy; reinforced by wages, job security, and potential for promotions; and balanced by poor supervisory practices, provider stress and poor work-life balance;
- At the team- or inter-personal level – by the satisfaction of sense of competence and autonomy (i.e., collective efficacy) and the recursive use of performance information to design, test and evaluate rapid cycles of improvement. Also, at the team level, by the identification of team members with a collective sense of social identity; reinforced by community recognition and increased stature in the community; by individual-level intrinsic motivation; and, by team-awards. Such mechanisms can be balanced by lack of support in the form of appropriate working conditions and supplies, supportive supervision, stress and poor work-life balance; and,
- At the inter-organizational level, by the diffusion of lessons and sharing of knowledge through participation in performance dialogues, and collaboration with other teams in high-stakes, focusing events;

Leading to the following *outputs and outcomes*:

- Among individual providers: Workload; work morale; stress; burnout; staff turnover; sick leave; absenteeism.
- At the team-level: Quality of care and process improvements; adherence to recommended practice guidelines; patient satisfaction; perceived quality of care; workforce retention; unintended organizational outcomes.
- At the patient- and community levels: Utilization of services; coverage of interventions or services; access to primary care services; health equity effects; adverse health effects or harm; unintended population health outcomes

Finally, the use of powerful supply-side financial incentives by SMI at the higher echelons of the MOH may trigger additional mechanisms and outcomes (positive and negative; intended, and otherwise) that need to be further researched and that will be the subject of a separate paper. We expect the PT to continue

to be adjusted as new findings emerge from the realist evaluation of SMI in El Salvador and Honduras.

Discussion

To date SMI and the Salvadorian MOH have achieved major gains in primary care performance at the national as well as the primary care delivery levels. Changes in individual- and team-level provider beliefs and behaviors are associated with increased motivation and productivity. The refined PT highlights causal pathways that can plausibly explain how team-based performance improvements can accumulate and lead to system-wide performance gains. Results also provide an in-depth look at the role played by motivated, primary care teams in explaining SMI's program success in El Salvador.

Our findings suggest that the individual and interpersonal motives that underlie the high performance of CHTs is complex and dynamic, and that PMM interventions implemented by SMI influence these complex motivations in ultimately positive ways. There is also some indication from the data that other interventions implemented as part of SMI contributed to CHT performance improvement, such as national level financial incentives, by creating a positive environment for focusing on performance and embracing data to problem-solve. Findings also indicate that the organizational arrangement of primary care around community-embedded teams by the health reform effort that preceded SMI has been a complementary and necessary contextual foundation for the effective implementation of SMI's PMM interventions. The interplay between these two factors was not accidental, but the product of deliberate actions by the stakeholders involved. Such interactive and responsive approach to program design and implementation is one of the key contributing factors for the triggering of individual and team-based interpersonal motivation which, in turn, is one of the main causal mechanisms driving the high performance observed in these municipalities.

An over-arching sense of commitment was expressed by all front-line respondents that can be plausibly explained by the reinforcing effect of different individual and interpersonal mechanisms. This sense of commitment has its roots in the Salvadoran Health Reform, which has not only brought these teams in close proximity to communities, but has also increased team commitment and contributed to the autonomy, competence and relatedness that individuals need to stay motivated. Closeness to communities has increased social standing and status for CHT members, as well as community recognition, and appears to be an additional source of motivation for the entire team, a finding supported by recent evidence^{21,92,93}.

At the individual level, respondents reported extrinsic and intrinsic motives that combined in positive, reinforcing manner. Such a mix of financial and non-financial incentives can enhance performance among community-level, frontline workers¹³. The data also indicate that front-line workers value fair wages, a sense of job security, the provision of in-kind

incentives and awards, and community recognition. SMI PMM interventions supported these extrinsic and intrinsic motives through the team-based performance incentives and the recognition given during performance dialogue meetings. Intrinsic motives that prevail are those that satisfy the needs for competence, autonomy and relatedness as described by Self-Determination Theory^{62,64,66,71,83,84} and as hypothesized in our preliminary PT³⁹.

Motivated individual frontline workers have coalesced into highly effective teams whose purpose and action were further reinforced by their sense of commitment to achieve community-based health targets and by the supportive environment generated by the MOH and SMI. This included the creation of “safe” spaces for dialogue about performance, using data collected both by SMI, IHME, and the MOH, and a slow change from punitive to supportive attitudes when performance was below expectation, and to recognition when it met or exceeded expectations.

SMI interventions also raised the stakes among front-line teams. In addition to the external verification of performance conducted by IHME every two years, four waves of data collection were also conducted by SMI, as part of the impact evaluation of the in-kind, team incentives PMM intervention. This data collection initiative not only increased the frequency of external performance measurements and data availability to the CHTs, but may have amplified emotional and cognitive effects on CHTs^{49,94,95}, thus triggering inter-personal mechanisms that improved team performance, in response to the continuous performance measurement.

Team motivation was also sparked by the social, participatory dissemination activities that are part of the SMI PMM interventions. SMI provided feedback on team performance achievements and in-kind incentives to successful CHTs during regular high-stakes meetings, which are often called performance dialogues in the public management literature^{24,96,97} and serve as spaces for learning and knowledge-sharing. Our results indicate that reflection, planning and action-oriented social activities took place during these meetings, and that these events helped CHTs make sense of performance data and triggered the utilization of performance information by the teams, an important organizational level outcome^{18,33,49,53,98}. The “extra dose” of team-based performance measurement, the associated recognition of high-performing teams, and the ongoing performance dialogues, were identified by respondents as important sources of mostly positive team-based motivation.

Some of our findings on team-based motivation are promising and require further research. The theories of motivation reviewed for this evaluation mainly focused on individual-level mechanisms. However, our preliminary PT hypothesized a multi-level approach to performance improvement that *a priori* identified individual, interpersonal, and inter-organizational mechanisms of system change. Our findings indicate that team-based motivation, and not just individual motivation, may play a larger role in explaining performance improvement than initially expected. In turn, performance dialogues triggered

diffusion effects that suggest team-level and inter-organizational mechanisms that enabled higher performance. The role of other SMI interventions, especially of the national level financial performance incentives, likely contributed to the creation of the spaces for performance dialogue and the enabling environment for the diffusion effects; however, this study was not designed to investigate the relationships among the different SMI interventions, in particular their relative contribution to performance improvement effects on primary care provision by CHTs; future research could focus on this question.

Our findings underline some mechanisms that could trigger negative, unintended effects among front-line workers. In particular, the sense of sacrifice and stress from performance measurement among over-worked providers, while being positive for intrinsically motivated individuals, may become a source of work-life imbalances, burnout, and job dissatisfaction in others. This is an area with major policy implications that also requires further research^{7,99}.

The findings here help characterize the complex proximal and intermediate program effects at the level of community health teams (process improvements, outputs, and organizational effects) that had not been previously recognized by program designers. This will help SMI consider new metrics and causal pathways that can further complement future program adjustments and improvements to their evaluation agenda.

Strengths of this study include the use of program theory to both hypothesize and then characterize the causal linkages among several concurrent “interventions”: 1) a health system undergoing a major reform; 2) the actions and reactions triggered by SMI PMM interventions among autonomous individuals and teams of primary care providers; and, 3) the proximal and intermediate, provider, and organizational-level effects that have been triggered in this successful program. The use of a realist evaluation approach to explain program outcomes mitigates the limitations of conventional case studies inasmuch as the refined PT contributes explanations that can be tested and further refined⁴⁴. Other strengths include the use of systematic procedures to limit researcher bias (reflexivity, audit trails, etc.), and the triangulation of multiple data sources, which is essential for rigorous case study¹⁰⁰.

There are also several limitations in the study. Due to budgetary and operational limitations, we did not address primary care beneficiaries’ perceptions of the services provided by the teams that were studied. We may have therefore missed relevant perspectives about the quality of interactions between providers and their clients, and the mechanisms thus triggered, or not. Such demand-side perspective is also relevant given the importance that providers’ descriptions of community recognition and closeness had in our results, an area that needs to be further characterized. Finally, we are unable to assess which of the two types of external measurement (IHME every 24 months with financial incentives at the national level, and SMI’s own

external measurement of CHT performance every 6 months) has greater influence on primary care performance. This is consequence of the qualitative, single-country case study design, which, while best suited for developing program theory, cannot assess the relative impacts of these two very different forms of external measurement on various dimensions of primary care performance.

For this study we purposively selected the highest performing districts in El Salvador to identify what motivations and mechanisms, at different levels, were likely driving good performance, and how SMI PMM interventions were contributing to the results (listed in Table 1). Our data shows clear patterns of motivational mechanisms at individual, interpersonal team, and organizational levels, and clearly outlines the dynamic between the PMM interventions and the ongoing/preceding health reforms, and how these have worked together in high performing municipalities in El Salvador. We would have liked to confirm our findings, using the same recognized methodological approach⁴⁶, in lower performing districts, assessing context, intrinsic and extrinsic motivations at individual and team levels, and the implementation quality of the SMI PMM interventions in those districts. This would have validated the presence or absence of the context-mechanism-outcome pathways identified in our refined PT.

Additional research in El Salvador SMI program may include further characterizing the role that CHTs' "embeddedness" in local communities has upon team performance and health outcomes; studying organizational performance in under-performing teams; and testing and validating scales of self-determination, collective efficacy and social identity among frontline workers. While there is a long tradition of team research in organizational science¹⁰¹, management studies¹⁰², and team science^{103,104}, team behavior and dynamics has been scarcely investigated in the healthcare contexts¹⁰⁵ of LMICs. Addressing these gaps may be of relevance as universal coverage models of primary care, like the Salvadorian CHT, inform reforms in other LMICs.

Conclusions

To date, SMI and the Salvadoran MOH have achieved major health gains at the national and municipal levels, where primary care services are actually delivered. SMI's PMM interventions have reinforced high performance by community health teams, by providing additional pro-performance and pro-social motivation, and modifying the intrinsic and extrinsic motivation among individual workers and teams, changes that started with the Salvadorian health reform. SMI interventions that have contributed to reinforcing motivation include the continuous, external measurement of CHT performance; the use of in-kind, team-based incentives; and, high-stakes performance dialogue and learning platforms that are regularly scheduled.

The aim of this realist evaluation is to identify plausible causal explanations for SMI-induced performance improvements at a "whole-system level"^{56,57} in the context of a low-income,

high-performance country like El Salvador. We found that changes in individual- and team-level beliefs and behaviors are associated with increased motivation and productivity, and were supported by SMI PMM interventions. Our refined PT identifies causal pathways that plausibly explain how team-based performance improvements can accumulate and lead to system-wide performance gains. Results also provide an in-depth look at the contributions of motivated, primary care delivery teams, which also help explain SMI's program success in El Salvador. However, SMI interventions occurring at higher-levels in the health system (e.g., policy-makers and mid-level managers) will likely have triggered additional mechanisms whose interplay with the context may have also contributed to the observed system behavior (i.e., high-performance) as hypothesized in the preliminary PT. Subsequent papers will address change at those other levels in the health system.

The findings here can inform policy design in El Salvador and other LMIC countries with similar contexts, when health system stakeholders need to consider ways to effectively engage teams of primary care providers to improve the universal delivery of public, primary care services. The insights obtained can help SMI consider program adjustments and enhance their evaluation agenda. Findings reported here can also help inform policy design in El Salvador and other LMIC with similar contexts when considering system-wide approaches that effectively engage primary care providers in achieving the lofty goals of universal health coverage and the sustainable development goals. Our findings can also contribute to ongoing and future policy work by LMIC agencies and global health funders interested in achieving high-quality health systems¹⁰⁶ through the use of PMM interventions. Finally, the use of a theory-driven approach to program evaluation can help define research agendas on PMM in SMI as well as in other LMIC.

Data availability

This manuscript contains examples of de-identified data acquired through interviews and recorded in transcripts and context-mechanism-outcome configurations. In order to protect participants' confidentiality, additional qualitative data is available upon request from the corresponding author. The majority of respondents in the study work in small local area settings, with a risk of identification by others. As per the study protocol, participants consented to participate in the study under the guarantee of confidentiality. Qualitative data can be obtained by contacting Wolfgang Munar, MD, SM, Milken Institute School of Public Health. Access to this dataset will be provided only upon submission of a specific research proposal.

Grant information

This work was supported by the Bill and Melinda Gates Foundation (grant number OPP1154415).

The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.

References

1. Bitton A, Ratcliffe HL, Veillard JH, *et al.*: **Primary Health Care as a Foundation for Strengthening Health Systems in Low- and Middle-Income Countries.** *J Gen Intern Med.* 2017; **35**(2): 566–571.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
2. Kruk ME, Porignon D, Rockers PC, *et al.*: **The contribution of primary care to health and health systems in low- and middle-income countries: a critical review of major primary care initiatives.** *Soc Sci Med.* 2010; **70**(6): 904–911.
[PubMed Abstract](#) | [Publisher Full Text](#)
3. Gates B: **The next epidemic—lessons from Ebola.** *N Engl J Med.* 2015; **372**(15): 1381–4.
[PubMed Abstract](#) | [Publisher Full Text](#)
4. Munar W, Snilstveit B, Stevenson J, *et al.*: **Evidence gap map of performance measurement and management in primary care delivery systems in low- and middle-income countries – Study protocol [version 1; referees: 2 approved].** *Gates Open Res.* 2018; **2**: 27.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
5. Scott VK, Gottschalk LB, Wright KQ, *et al.*: **Community Health Workers' Provision of Family Planning Services in Low- and Middle-Income Countries: A Systematic Review of Effectiveness.** *Stud Fam Plann.* 2015; **46**(3): 241–261.
[PubMed Abstract](#) | [Publisher Full Text](#)
6. Pfaffmann Zambuni J, Rasanathan K, Hipgrave D, *et al.*: **Community health systems: allowing community health workers to emerge from the shadows.** *Lancet Glob Health.* 2017; **5**(9): e866–e867.
[PubMed Abstract](#) | [Publisher Full Text](#)
7. Willis-Shattuck M, Bidwell P, Thomas S, *et al.*: **Motivation and retention of health workers in developing countries: a systematic review.** *BMC Health Serv Res.* 2008; **8**: 247.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
8. Vareilles G, Marchal B, Kane S, *et al.*: **Understanding the motivation and performance of community health volunteers involved in the delivery of health programmes in Kampala, Uganda: a realist evaluation.** *BMJ Open.* 2015; **5**(11): e008614.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
9. Perry JL, Hondeghe A, Wise LR: **Revisiting the motivational bases of public service: Twenty years of research and an agenda for the future.** *Public Adm Rev.* 2010; **70**(5): 681–690.
[Publisher Full Text](#)
10. Okello DR, Gilson L: **Exploring the influence of trust relationships on motivation in the health sector: a systematic review.** *Hum Resour Health.* 2015; **13**(1): 16.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
11. Naimoli JF, Frymson DE, Wuliji T, *et al.*: **A Community Health Worker “logic model”: towards a theory of enhanced performance in low- and middle-income countries.** *Hum Resour Health.* 2014; **12**(1): 56.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
12. Mathauer I, Imhoff I: **Health worker motivation in Africa: the role of non-financial incentives and human resource management tools.** *Hum Resour Health.* 2006; **4**(1): 24.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
13. Kok MC, Dieleman M, Taegtmeyer M, *et al.*: **Which intervention design factors influence performance of community health workers in low- and middle-income countries? A systematic review.** *Health Policy Plan.* 2015; **30**(9): 1207–1227.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
14. Harari MB, Herst DEL, Parola HR, *et al.*: **Organizational Correlates of Public Service Motivation: A Meta-analysis of Two Decades of Empirical Research.** *J Publ Adm Res Theor.* 2017; **27**(1): 68–84.
[Publisher Full Text](#)
15. Bailey C, Blake C, Schriver M, *et al.*: **A systematic review of supportive supervision as a strategy to improve primary healthcare services in Sub-Saharan Africa.** *Int J Gynaecol Obstet.* 2016; **132**(1): 117–125.
[PubMed Abstract](#) | [Publisher Full Text](#)
16. Borghi J, Lohmann J, Dale E, *et al.*: **How to do (or not to do)... Measuring health worker motivation in surveys in low- and middle-income countries.** *Health Policy Plan.* 2018; **33**(2): 192–203.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
17. Pollitt C: **Context in public policy and management: The missing link?** *J Publ Adm Res Theor.* 2005; **16**: 25–44.
18. Pollitt C: **Performance management 40 years on: a review. Some key decisions and consequences.** *Public Money Manage.* 2018; **38**(3): 167–174.
[Publisher Full Text](#)
19. Ritz A, Brewer GA, Neumann O: **Public Service Motivation: A Systematic Literature Review and Outlook.** *Public Admin Rev.* 2016; **76**(3): 414–426.
[Publisher Full Text](#)
20. Andrews R, Boyne GA: **Capacity, Leadership, and Organizational Performance: Testing the Black Box Model of Public Management.** *Public Admin Rev.* 2010; **70**(3): 443–454.
[Publisher Full Text](#)
21. Kok MC, Kane SS, Tulloch O, *et al.*: **How does context influence performance of community health workers in low- and middle-income countries? Evidence from the literature.** *Health Res Policy Syst.* 2015; **13**: 13.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
22. Bourne M, Franco-Santos M, Micheli P, *et al.*: **Performance measurement and management: a system of systems perspective.** *Int J Prod Res.* 2018; **56**(8): 2788–2799.
[Publisher Full Text](#)
23. Borgonovi E, Anessi-Pessina E, Bianchi C: **Outcome-Based Performance Management in the Public Sector.** Cham, Switzerland: Springer; 2017.
[Publisher Full Text](#)
24. Rajala T, Laihonon H, Vakkuri J: **Shifting from Output to Outcome Measurement in Public Administration—Arguments Revisited.** In: Borgonovi E, Anessi-Pessina E, Bianchi C, eds. *Outcome-Based Performance Management in the Public Sector.* Cham, UK: Springer; 2018; 3–23.
[Publisher Full Text](#)
25. Bevan G: **Setting targets for health care performance: lessons from a case study of the English NHS.** *Natl Inst Econ Rev.* 2006; **197**(1): 67–79.
[Publisher Full Text](#)
26. Bevan G, Hood C: **What's measured is what matters: targets and gaming in the English public health care system.** *Public Adm.* 2006; **84**(3): 517–538.
[Publisher Full Text](#)
27. Bevan G, Wilson D: **Does 'naming and shaming' work for schools and hospitals? Lessons from natural experiments following devolution in England and Wales.** *Public Money Manage.* 2013; **33**(4): 245–252.
[Publisher Full Text](#)
28. Suthar AB, Nagata JM, Nsanzimana S, *et al.*: **Performance-based financing for improving HIV/AIDS service delivery: a systematic review.** *BMC Health Serv Res.* 2017; **17**(1): 6.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
29. Cepiku D, Hinna A, Scarozza D, *et al.*: **Performance information use in public administration: an exploratory study of determinants and effects.** *Journal of Management & Governance.* 2017; **21**(4): 963–991.
[Publisher Full Text](#)
30. Belle N, Cantarelli P: **What Causes Unethical Behavior? A Meta-Analysis to Set an Agenda for Public Administration Research.** *Public Adm Rev.* 2017; **77**(3): 327–339.
[Publisher Full Text](#)
31. Kelman S, Friedman JN: **Performance improvement and performance dysfunction: an empirical examination of distortionary impacts of the emergency room wait-time target in the English National Health Service.** *J Public Adm Res Theory.* 2009; **19**(4): 917–946.
[Publisher Full Text](#)
32. Witter S, Fretheim A, Kessy FL, *et al.*: **Paying for performance to improve the delivery of health interventions in low- and middle-income countries.** *Cochrane Database Syst Rev.* 2012; (2): CD007899.
[PubMed Abstract](#) | [Publisher Full Text](#)
33. Pollitt C: **The logics of performance management.** *Evaluation.* 2013; **19**(4): 346–363.
[Publisher Full Text](#)
34. EPOC: **EPOC Taxonomy.** The Cochrane Collaboration; 2015.
[Reference Source](#)
35. Eichler R, Nelson J, Iriarte E, *et al.*: **The initial prize in the Salud Mesoamerica initiative results-based aid initiative - Strengthened Health Systems for Reproductive, Maternal, Neonatal and Child Outcomes.** Washington, DC: Inter-American Development Bank; 2017.
[Publisher Full Text](#)
36. IADB: **Operating Model.** Salud Mesoamerica 2015: Results Based Funding. Inter-American Development Bank. Accessed Nov. 2017, 2017.
[Reference Source](#)
37. Bernal P, Martinez S: **In-kind incentives and health worker performance: Experimental evidence from El Salvador.** Washington, DC: Inter-American Development Bank; March-18-2018. 2018.
38. Mokdad AH, Colson KE, Zúñiga-Brenes P, *et al.*: **Salud Mesoamérica 2015 Initiative: design, implementation, and baseline findings.** *Popul Health Metr.* 2015; **13**(1): 3.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
39. Munar W, Wahid SS, Curry L: **Characterizing performance improvement in primary care systems in Mesoamerica: A realist evaluation protocol [version 2; referees: 2 approved, 1 approved with reservations].** *Gates Open Res.* 2018; **2**: 1.
[Publisher Full Text](#)
40. World-Bank: **El Salvador at a glance.** Accessed August 9, 2018, 2018.
[Reference Source](#)
41. WHO: **El Salvador - Country Profile.** Accessed August 9, 2018, 2018.
[Reference Source](#)
42. Global-Health-Workforce-Alliance: **Mid-level health workers for delivery of essential health services - A global systematic review and country experiences.** Geneva: WHO - Global Health Workforce Alliance; 2012.
[Reference Source](#)
43. Pawson R, Tilley N: **Realistic evaluation.** Sage; 1997.
[Reference Source](#)

44. Pawson R: **Evidence-based policy: A realist perspective**. Thousand Oaks, CA: Sage Publications; 2006.
[Publisher Full Text](#)
45. Laihonon H: **A managerial view of the knowledge flows of a health-care system**. *Knowl Man Res Pract*. 2015; **13**(4): 475–485.
[Publisher Full Text](#)
46. Patton MQ: **Qualitative Research & Evaluation Methods: Integrating Theory and Practice**. 4th ed. Thousand Oaks, CA: Sage Publications; 2014.
[Reference Source](#)
47. Vandenabeele W, Skelcher C: **Review: Public service motivation-practical problems, scientific evidence and the role of a research community**. *Public Money Manage*. 2015; **35**(5): 321–327.
[Publisher Full Text](#)
48. Schwartz R: **Public Management Theory, Evaluation, and Evidence-Based Policy**. In: Rist RC, ed. *Mind the Gap: Perspectives on Policy Evaluation and the Social Sciences*. New Brunswick, USA: Transaction Publishers; 2011; **16**.
49. Moynihan DP, Ingraham PW: **Integrative leadership in the public sector: A model of performance-information use**. *Admin Soc*. 2004; **36**(4): 427–453.
[Publisher Full Text](#)
50. Moynihan DP: **Explaining the Implementation of Performance Management Reforms**. In: *The Dynamics of Performance Management*. Washington, DC: Georgetown University Press; 2008.
[Reference Source](#)
51. Moynihan DP: **The dynamics of performance management: Constructing information and reform**. Washington, DC: Georgetown University Press; 2008.
[Reference Source](#)
52. Moynihan DP, Landuyt N: **How do public organizations learn? Bridging cultural and structural perspectives**. *Public Admin Rev*. 2009; **69**(6): 1097–1105.
[Publisher Full Text](#)
53. Moynihan DP, Pandey SK: **The big question for performance management: Why do managers use performance information?** *J Public Adm Res Theory*. 2010; **20**(4): 849–866.
[Publisher Full Text](#)
54. Greenhalgh T, Robert G, MacFarlane F, et al.: **Diffusion of Innovations in Health Service Organisations: A Systematic Literature Review**. Malden, MA: Blackwell Publishing; 2005; **82**.
[Publisher Full Text](#)
55. Greenhalgh T, Wherton J, Papoutsis C, et al.: **Beyond Adoption: A New Framework for Theorizing and Evaluating Nonadoption, Abandonment, and Challenges to the Scale-Up, Spread, and Sustainability of Health and Care Technologies**. *J Med Internet Res*. 2017; **19**(11): e367.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
56. Greenhalgh T, Humphrey C, Hughes J, et al.: **How Do You modernize a health service? A realist evaluation of whole-scale transformation in London**. *Milbank Q*. 2009; **87**(2): 391–416.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
57. Best A, Greenhalgh T, Lewis S, et al.: **Large-system transformation in health care: a realist review**. *Milbank Q*. 2012; **90**(3): 421–456.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
58. McMullen H, Griffiths C, Leber W, et al.: **Explaining high and low performers in complex intervention trials: a new model based on diffusion of innovations theory**. *Trials*. 2015; **16**: 242.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
59. Bandura A: **Self-efficacy: toward a unifying theory of behavioral change**. *Psychol Rev*. 1977; **84**(2): 191–215.
[PubMed Abstract](#) | [Publisher Full Text](#)
60. Bandura A: **Self-efficacy mechanism in human agency**. *Am Psychol*. 1982; **37**(2): 122–147.
[Publisher Full Text](#)
61. Bandura A: **Human agency in social cognitive theory**. *Am Psychol*. 1989; **44**(9): 1175–84.
[PubMed Abstract](#) | [Publisher Full Text](#)
62. Andrews C: **Integrating public service motivation and self-determination theory A framework**. *International Journal of Public Sector Management*. 2016; **29**(3): 238–254.
[Publisher Full Text](#)
63. Deci EL, Ryan RM: **The general causality orientations scale: Self-determination in personality**. *J Res Pers*. 1985; **19**(2): 109–134.
[Publisher Full Text](#)
64. Deci EL, Ryan RM: **The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior**. *Psychol Inq*. 2000; **11**(4): 227–268.
[Publisher Full Text](#)
65. Ryan RM, Deci EL: **Self-determination theory: Basic psychological needs in motivation, development, and wellness**. New York: Guilford Publications; 2017.
[Reference Source](#)
66. Gagné M, Deci EL: **Self-determination theory and work motivation**. *J Organ Behav*. 2005; **26**(4): 331–362.
[Publisher Full Text](#)
67. Vareilles G, Pommier J, Marchal B, et al.: **Understanding the performance of community health volunteers involved in the delivery of health programmes in underserved areas: a realist synthesis**. *Implement Sci*. 2017; **12**(1): 22.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
68. Lohmann J, Houffort N, De Allegri M: **Crowding out or no crowding out? A Self-Determination Theory approach to health worker motivation in performance-based financing**. *Soc Sci Med*. 2016; **169**: 1–8.
[PubMed Abstract](#) | [Publisher Full Text](#)
69. Lohmann J, Soares A, Tiendrebéogo J, et al.: **Measuring health workers' motivation composition: validation of a scale based on Self-Determination Theory in Burkina Faso**. *Hum Resour Health*. 2017; **15**(1): 33.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
70. Lohmann J, Wilhelm D, Kambala C, et al.: **'The money can be a motivator, to me a little, but mostly PBF just helps me to do better in my job.' An exploration of the motivational mechanisms of performance-based financing for health workers in Malawi**. *Health Policy Plan*. 2018; **33**(2): 183–191.
[PubMed Abstract](#) | [Publisher Full Text](#)
71. Vareilles G, Marchal B, Kane S, et al.: **Understanding the motivation and performance of community health volunteers involved in the delivery of health programmes in Kampala, Uganda: a realist evaluation**. *BMJ open*. 2015; **5**(11): e008614.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
72. Scott WR, Ruef M, Mendel PJ, et al.: **Institutional change and healthcare organizations: From professional dominance to managed care**. Chicago: The University of Chicago Press; 2000.
[Reference Source](#)
73. Thornton PH, Ocasio W, Lounsbury M: **The institutional logics perspective: A new approach to culture, structure, and process**. Oxford University Press; 2012.
[Publisher Full Text](#)
74. Scott K, Beckham SW, Gross M, et al.: **What do we know about community-based health worker programs? A systematic review of existing reviews on community health workers**. *Hum Resour Health*. 2018; **16**(1): 39.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
75. Bailey C, Blake C, Schriver M, et al.: **A systematic review of supportive supervision as a strategy to improve primary healthcare services in Sub-Saharan Africa**. *Int J Gynaecol Obstet*. 2016; **132**(1): 117–125.
[PubMed Abstract](#) | [Publisher Full Text](#)
76. Franco LM, Bennett S, Kanfer R: **Health sector reform and public sector health worker motivation: a conceptual framework**. *Soc Sci Med*. 2002; **54**(8): 1255–1266.
[PubMed Abstract](#) | [Publisher Full Text](#)
77. Bénabou R, Tirole J: **Intrinsic and Extrinsic Motivation**. *Rev Econ Stud*. 2003; **70**(3): 489–520.
[Publisher Full Text](#)
78. Vroom VH: **Work and Motivation**. New York: Wiley; 1964.
[Reference Source](#)
79. Elster J, ed: **Rational choice**. New York: NYU Press; 1986.
[Reference Source](#)
80. Monroe KR, Maher KH: **Psychology and rational actor theory**. *Polit Psychol*. 1995; **16**(1): 1–21.
[Publisher Full Text](#)
81. Perry JL, Wise LR: **The motivational bases of public service**. *Public Adm Rev*. 1990; **50**(3): 367–373.
[Publisher Full Text](#)
82. Deci EL, Ryan RM: **Intrinsic motivation and self-determination in human behavior**. New York: Plenum; 1985.
[Publisher Full Text](#)
83. Deci EL, Ryan RM: **Self-determination theory: A macrotheory of human motivation, development, and health**. *Can Psychol*. 2008; **49**(3): 182–185.
[Publisher Full Text](#)
84. Ryan RM, Deci EL: **Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being**. *Am Psychol*. 2000; **55**(1): 68–78.
[PubMed Abstract](#) | [Publisher Full Text](#)
85. Finlay L: **Negotiating the swamp: the opportunity and challenge of reflexivity in research practice**. *Qual Res*. 2002; **2**(2): 209–230.
[Publisher Full Text](#)
86. Bandura A: **Exercise of human agency through collective efficacy**. *Curr Dir Psychol Sci*. 2000; **9**(3): 75–78.
[Publisher Full Text](#)
87. March JG, Olsen JP: **Rediscovering institutions**. Simon and Schuster; 2010.
[Reference Source](#)
88. Tajfel H: **Social identity and intergroup behaviour**. *Soc Sc Inform*. 1974; **13**(2): 65–93.
[Publisher Full Text](#)
89. Turner JC: **Towards a cognitive redefinition of the social group**. In: Tajfel H, ed. *Social Identity and Intergroup Relations*. London, UK: Cambridge University Press; 1982: 15–40.
[Reference Source](#)
90. Hogg MA, Terry DJ, White KM: **A tale of two theories: A critical comparison of identity theory with social identity theory**. *Soc Psychol Q*. 1995; **58**(4): 255–269.
[Publisher Full Text](#)
91. Hogg MA, Terry DI: **Social identity and Self-categorization processes in organizational contexts**. *Acad Manage Rev*. 2000; **25**(1): 121–140.
[Publisher Full Text](#)
92. Theobald S, Hawkins K, Kok M, et al.: **Close-to-community providers of health**

- care: increasing evidence of how to bridge community and health systems. In: *Hum Resour Health*. BioMed Central; 2016; **14**(1): 32.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
93. Kok MC, Broerse JEW, Theobald S, *et al.*: **Performance of community health workers: situating their intermediary position within complex adaptive health systems.** *Hum Resour Health*. 2017; **15**(1): 59.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
 94. Mark MM, Henry GT: **The Mechanisms and Outcomes of Evaluation Influence.** *Evaluation*. 2004; **10**(1): 35–57.
[Publisher Full Text](#)
 95. Henry GT, Mark MM: **Beyond use: Understanding evaluation's influence on attitudes and actions.** *Am J Eval*. 2003; **24**(3): 293–314.
[Publisher Full Text](#)
 96. Laihonon H, Mantyla S: **Principles of performance dialogue in public administration.** *International Journal of Public Sector Management*. 2017; **30**(5): 414–428.
[Publisher Full Text](#)
 97. Laihonon H, Mantyla S: **Organizing for Learning: Performance Dialogue in Local Government.** In: Erickson GS, Rothberg HN, eds. *Proceedings of the 13th International Conference on Intellectual Capital Knowledge Management Organisational Learning*. 2016; 174–181.
[Reference Source](#)
 98. Pollitt C: **Performance management in practice: A comparative study of executive agencies.** *J Public Adm Res Theory*. 2006; **16**(1): 25–44.
[Publisher Full Text](#)
 99. Lassi ZS, Musavi NB, Maliqi B, *et al.*: **Systematic review on human resources for health interventions to improve maternal health outcomes: evidence from low- and middle-income countries.** *Hum Resour Health*. 2016; **14**(1): 10.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
 100. Yin RK: **Case Study Research: Design and Methods.** Fifth ed. Thousand Oaks, CA: Sage Publications; 2014.
[Reference Source](#)
 101. Sewell G: **The discipline of teams: The control of team-based industrial work through electronic and peer surveillance.** *Adm Sci Q*. 1998; **43**(2): 397–428.
[Publisher Full Text](#)
 102. Katzenbach JR, Smith DK: **The discipline of teams.** *Harv Bus Rev*. 1993; **71**(2): 111–120.
[PubMed Abstract](#)
 103. Stokols D, Misra S, Moser RP, *et al.*: **The ecology of team science: understanding contextual influences on transdisciplinary collaboration.** *Am J Prev Med*. 2008; **35**(2 Suppl): S96–S115.
[PubMed Abstract](#) | [Publisher Full Text](#)
 104. Börner K, Contractor N, Falk-Krzesinski HJ, *et al.*: **A multi-level systems perspective for the science of team science.** *Sci Transl Med*. 2010; **2**(49): 49cm24.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
 105. Nancarrow SA, Booth A, Ariss S, *et al.*: **Ten principles of good interdisciplinary team work.** *Hum Resour Health*. 2013; **11**(1): 19.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
 106. Kruk ME, Gage AD, Arsenault C, *et al.*: **High-quality health systems in the Sustainable Development Goals era: time for a revolution.** *Lancet Glob Health*. 2018; **6**(11): e1196–e1252.
[PubMed Abstract](#) | [Publisher Full Text](#)

Open Peer Review

Current Peer Review Status: ? ?

Version 1

Reviewer Report 08 January 2019

<https://doi.org/10.21956/gatesopenres.13969.r26800>

© 2019 Lohmann J. This is an open access peer review report distributed under the terms of the [Creative Commons Attribution License](#), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.



Julia Lohmann

Heidelberg Institute of Global Health, Medical Faculty, Heidelberg University, Heidelberg, Germany

Thank you very much for giving me the opportunity to review this interesting work. I very much enjoyed reading the paper and find it a valuable addition to the growing but still insufficient literature on motivational mechanisms of health system strengthening interventions.

In a nutshell, the study presented investigated the mechanisms through which Salud Mesoamerica has effected change on important health system and population health outcomes in El Salvador, using a qualitative case study design grounded in the realist evaluation idea. Results highlight a number of contextual factors conducive to successful implementation and triggering of mechanisms, as well as various motivational mechanisms at play in producing impact, including individual-level extrinsic sources such as salaries, job security, and incentives; individual-level intrinsic motivational sources such as contributions to feelings of competence, autonomy, and relatedness; team-level sources such as team efficacy and knowledge sharing; and individual sources of demotivation such as dissatisfaction with lack of supplies or poor work-life balance.

I have two more substantial comments as well as a number of small comments which I hope will be helpful in improving the manuscript even further.

In addition, I have a question on ethics. You state that you were exempted, which I find unusual since you did do primary data collection. Could you kindly elaborate on this?

Finally, I am in agreement with the authors that making the data publically available is risky considering the respondent population.

Major comments:

1. My understanding is that the program theory under investigation has four broad elements, intervention components, the implementation context, the mechanisms through which the intervention in the context leads to outcomes, and the outcomes themselves (proximal and

intermediate). I further understand that findings from the overall project will be spread over several manuscripts. In this manuscript, the focus is supposed to be on the mechanisms, particularly on motivation, that link the intervention to the outcomes. Assuming that I have understood this correctly, I recommend that the authors do another critical reading and editing of the manuscript to ensure that all text is consistent with the aim of this specific paper. In particular, you state as research questions “(1) What are the effects of using supply-side incentives at the primary care delivery level, on the performance of the primary care delivery system? [...] And, (2) What are the effects of high-stakes external measurement on performance itself? [...]”. However, I struggle to find findings related to the outcomes. Text under “Refined Program Theory” in the results section remains hypothetical – I would therefore suggest moving it to the discussion section – , and the rest pertains to context and mechanisms. In the latter, where outcome references could be hidden, I struggle to find much. In the conclusion you state that “We found that changes in individual- and team-level beliefs and behaviors are associated with increased motivation and productivity, and were supported by SMI PMM interventions”, but productivity was neither measured explicitly nor discussed by respondents as far as I can tell from reading the results description. In light of this, I therefore recommend that the authors better streamline research questions, description of methods, description of results, and discussion, and focus them on the particular content of this paper and the results presented therein.

2. At the beginning of the discussion, you state that “the individual and interpersonal motives that underlie the high performance of CHTs is complex and dynamic, and that PMM interventions implemented by SMI influence these complex motivations in ultimately positive ways.” While I do not contest the possibility of such positive effects in any way, I wonder if this holds in less well-performing CHTs as well, or if your conclusion is rather positively biased given the specific sample. You briefly mention this issue at the end of the discussion, but I think it is so central that it deserves a more prominent space and intensive discussion. I wish to make explicit that I do not disagree with your decision to sample positive deviant cases as information-rich cases per se, but in light of the possible bias introduced by this, I would prefer if conclusions were somewhat “toned down” and possible implications discussed in more detail. Are the same contextual factors and mechanisms likely at play in less well performing CHTs, just less pronounced, or might there be additional and qualitatively different factors and mechanisms, or do perhaps some mechanisms only exist in high-performing environments pre-intervention?

Minor comments:

1. Methods: I was somewhat confused and “put on the wrong track” by the description of the methods, and believe this is because it seems that not all presented methods actually pertain to what you present in the paper (e.g. Table 3 includes non-participant observation for health outcomes, which are not explained anywhere and no findings appear in the results later). My recommendation would be to either reduce the description of the methods to only those components of the overall project that are actually relevant for the paper at hand, or to clearly mark what is part of the overall research project, and what is specifically relevant for the paper.
2. Methods, Preliminary PT development: The literature review is very comprehensive and very handy also beyond your specific purpose, so thank you for this. In case you are planning to update it further before indexing, I know of three additional similar papers having been

published recently:

- Gergen *et al.* (2018)¹
- Schuster *et al.* (2018)²
- Lohmann *et al.* (2018)³

3. Results, context: In the introduction, you state that “In this paper, we report program effects only from the perspective of CHTs; policy-level perspectives will be presented elsewhere.” However, the description of methods implies that you used interviews from all stakeholders including policy level, and what you report in the results under “context” is also relatively policy-/systems-focused. Could you kindly elaborate a little on this, and perhaps provide sample quotes for the context categories as well to aid the reader in translating the relatively generic text into concrete implications for the implementation/frontline service provision level?

4. Results, refined PT: I very much like how you present the modified program theory, but have three comments.

- First, as already mentioned above, I would prefer for this to be moved to the discussion, since the refined PT does not directly result from your study, but your study findings rather informed the further development of the PT. The actual resulting refined PT, however, goes beyond what your results covered (or at least those that you presented – links to outcomes are at most implied, but not made explicit).
- Second, I was a bit irritated by the last part of the PT (“leading to the following outputs”), but I think this is about semantics rather than actual substance. Specifically, aspects listed under individual providers are almost all phrased negatively (e.g. staff turnover instead of staff retention), implying that favourable context and triggered mechanisms lead to negative rather than positive effects. To ensure that even “fast readers” don’t accidentally misinterpret, you might want to consider if rephrasing slightly or adding an explicit note is an option.
- Third, I like the initial PT graph in Figure, and wonder if it is possible to make a refined graph that will allow the reader to contrast and compare “before and after” more easily. Right now, it is difficult for me to tell what changed exactly. In this context, please also note that the text about the refined PT refers back to Figure 1, which I understand is the initial rather than the refined PT.

References

1. Gergen J, Rajkotia Y, Lohmann J, Ravishankar N: Performance-based financing kick-starts motivational “feedback loop”: findings from a process evaluation in Mozambique. *Human Resources for Health*. 2018; **16** (1). [Publisher Full Text](#)
2. Schuster R, de Sousa O, Reme A, Vopelak C, et al.: Performance-Based Financing Empowers Health Workers Delivering Prevention of Vertical Transmission of HIV Services and Decreases Desire to Leave in Mozambique. *International Journal of Health Policy and Management*. 2018; **7** (7): 630-644 [Publisher Full Text](#)
3. Lohmann J, Muula AS, Houliort N, De Allegri M: How does performance-based financing affect health workers' intrinsic motivation? A Self-Determination Theory-based mixed-methods study in

Malawi. *Soc Sci Med.* **208**: 1-8 [PubMed Abstract](#) | [Publisher Full Text](#)

Is the work clearly and accurately presented and does it cite the current literature?

Partly

Is the study design appropriate and is the work technically sound?

Yes

Are sufficient details of methods and analysis provided to allow replication by others?

Partly

If applicable, is the statistical analysis and its interpretation appropriate?

Not applicable

Are all the source data underlying the results available to ensure full reproducibility?

No source data required

Are the conclusions drawn adequately supported by the results?

Partly

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Health systems, health workforce (part. motivation), health financing

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Reviewer Report 03 December 2018

<https://doi.org/10.21956/gatesopenres.13969.r26753>

© 2018 Van de Klundert J. This is an open access peer review report distributed under the terms of the [Creative Commons Attribution License](#), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.



Joris Van de Klundert

¹ Erasmus School of Health Policy & Management (ESHPM), Erasmus University Rotterdam, Rotterdam, Netherlands Antilles

² Prince Mohammad bin Salman College of Business & Entrepreneurship, King Abdulla Economic City, Saudi Arabia

An interesting piece of research, which I appreciate very much. Still I believe the manuscript can benefit considerably by a more focused positioning, as well as sharpening the final analysis step. See below.

General comment 1: Positioning

The introduction is not focused, and the part up to and including methods can be significantly better structured. For instance, the Background seems to be written with a research objective in mind (related to PMM) which differs from the research objective of the final sentence of the introduction (related to motivation). Both suggest a theory driven study. The next section then turns to describing SMI, which has essential results based financing characteristics. Moreover, the focus shifts somewhat to the need to (partially) evaluate SMI. In subsequent pages, the empirical embedding then zooms in on El Salvador and on certain THCs within El Salvador as positive outliers. Altogether this is a very long and meandering story line, which blurs the contribution of the manuscript.

The two-sided approach, both from theory, and from an empirical program evaluation perspective, can be a strength, and indeed if well done, the two can be married with middle range theory: a realist approach. The positioning of the present manuscript can do a much better job at this.

First of all I would suggest to introduce one term which covers both the results based components of the SMI, and the PMM. For instance Performance Based Finance & Management (PBFM). Doing so reduces the confusion about the study object. The Measurement is then simply introduced as an instrument, and the motivation is then left to the inner workings of the corresponding CIMO logic (as nicely depicted in the unnamed Figure 1).

The authors rightly argue that the impact of PBFM depends on context and further (implementation) details, and build on the argument that further middle range theory on this important and globally applied approach is necessary to understand by which Mechanisms, Context and Intervention together produce outcomes. Next, they can introduce SMI implementation in El Salvador as a program in which the research question can be well addressed. The selection of THCs within El Salvador can be fully postponed to the methods and data collection.

Background information on El Salvador and its health system, as well as on SMI achievements, can be moved to an appendix to improve the flow of the paper?

It is not necessary to position the study as part of SMI evaluation. It is worth reflecting a bit on selecting El Salvador and possible outliers only, as this approach without controls runs the risks of attributing results to mechanisms for which controls provide counter-evidence. Same context and intervention, but no results...

Altogether I believe the introduction and positioning can be considerably simplified to become more focused and improve the readership, especially for those readers who are not familiar with realist evaluation.

General Comment 2: Mechanisms

The authors appear to identify two levels of positively impacting mechanisms, individual and team level. A third mechanisms category is Demotivation. The manuscript doesn't convince me in

presenting these two levels and category together as 3 mechanisms. It seems that within these levels and categories essentially different mechanisms are at play. For instance, under demotivation we have 'work life balance' and 'dissatisfaction with lack of supply'. Likewise, under individual we have 'wages and benefits on the one hand and 'sense of relatedness with community' on the other hand. These must clearly represent different mechanisms. At the team-level we have 'closeness to community (which appears to be associated with the same mechanisms as the individual level 'relatedness') and inter-team learning and knowledge sharing. Again, these are so distinct that they inevitably relate to different mechanisms. Hence, the authors need to dissect their mechanism levels and category, and analyse one level deeper to propose mechanisms. These mechanisms can subsequently be related to theory for verification/falsification and converted into a final PT, and corresponding discussion and conclusions. This will enable to articulate them better. The sentences describing mechanisms as currently presented in Box 3 lack clarity on what exactly is the 'mechanism', by which mechanics are the outcomes produced. The current descriptions are very elaborated, yet tend to be static and imprecise. They are therefore also not very helpful for policy makers, and make it difficult to discuss these and arrive at conclusions later on. The authors have done a wonderful job on data collection and analysis. In my view it deserves an additional step which provides more clarity of results and thereby can improve meaning and impact substantially.

Detailed Comments:

1. The opening sentence of the introduction is too long. Please cut in two.
2. Last sentence of the introduction is grammatically incorrect. (the role of motivation on....)
3. There is no heading for Figure 1.
4. Page 7, left column, just below Table. Box 1 is claimed to present the study protocol in detail, but it doesn't.
5. Under 'Data collection methods'. The claim about optimality of the research methods is unscientific and should be dropped, or proven. It is not necessary, the data collection methods are fine.
6. Still under data collection methods, the sentence 'We use a purposeful.....in El Salvador' is flawed. Moreover, this is not so much about data collection method as it is about research design. Please move this earlier, where the design is motivated first.
7. The authors need to elaborate better how the interview protocol relates to the program theory and specifically to any hypothesized CMOs. Add the interview protocol as an appendix for transparency. Was the translation of the interviews done by certified translators? If not, how was quality ensured?
8. Under data analysis, the authors write that emerging themes were arranged in tables? It is not clear what the method is here? How does it relate to the qualitative analysis in NVIVO? What does it provide additionally? Why are tables a good means to the end? What is the structure of the tables? Please be transparent and convince the reader of the appropriateness of the methods.
9. Results: the 3rd and 4th contextual factors can from a higher level also be viewed as mechanisms. Please position them more clearly as a contextual factor, e.g. by emphasizing the organizational or static characteristics over the action (leverage, expose).
10. Detailed comments on discussion and conclusions may apply after addressing general comment 2.

Is the work clearly and accurately presented and does it cite the current literature?

Partly

Is the study design appropriate and is the work technically sound?

Partly

Are sufficient details of methods and analysis provided to allow replication by others?

Partly

If applicable, is the statistical analysis and its interpretation appropriate?

Not applicable

Are all the source data underlying the results available to ensure full reproducibility?

Yes

Are the conclusions drawn adequately supported by the results?

Yes

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Heath services management, healthcare improvement

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Author Response 07 Dec 2018

Wolfgang Munar, George Washington University, Washington, USA

Our appreciation to Prof. Van de Klundert for his meticulous and actionable review. We will address his suggestions in the next version of this paper.

Wolfgang Munar, on behalf of the research team

Competing Interests: No competing interests were disclosed.