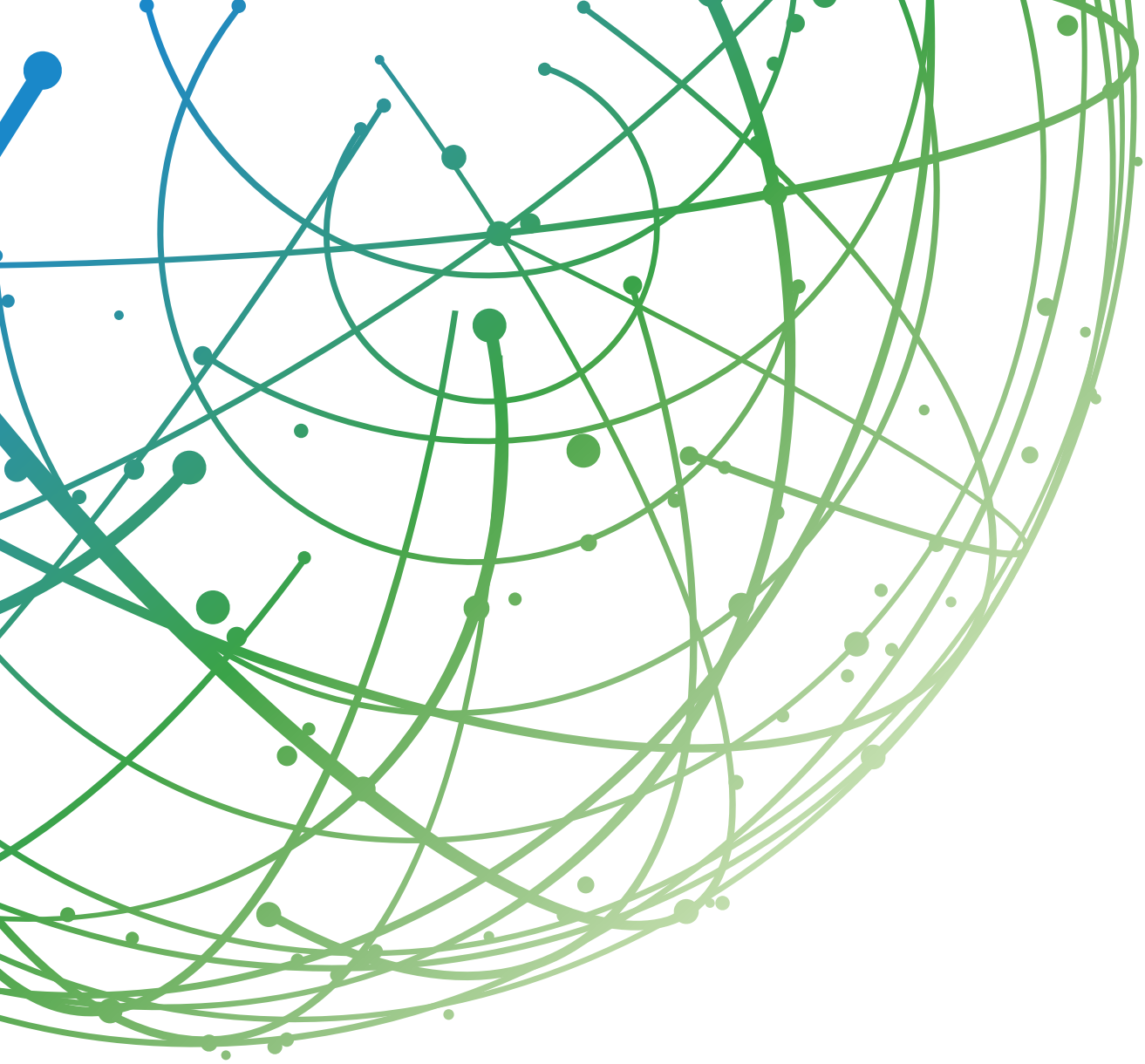

GLOBAL DIFFUSION OF HEALTHCARE INNOVATION

MAKING THE CONNECTIONS

Report of the Global Diffusion of Healthcare Innovation (GDHI) Working Group

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CONTENTS

03 Foreword
04 Executive summary
10 Section 1: Background to global diffusion of healthcare innovation
15 Section 2: Methodology
17 Section 3: Research findings
53 Section 4: Discussion and recommendations
61 Appendices
78 Abbreviations
79 Acknowledgments
80 List of interviewees
84 References

FOREWORD

Where do people on the frontline of healthcare look for innovative solutions to the clinical and organizational problems that they and their patients face? This study, the third in the Global Diffusion of Healthcare Innovation (GDHI) research series, examines how frontline health workers (FHWs) and healthcare leaders in six different parts of the world source innovations to meet their needs. It also examines the role of curator organizations in propagating ideas and solutions for those needs.

This focus on the demand or 'pull' for innovation, rather than the supply of innovation, is a novel perspective for the literature about diffusion of innovation, which traditionally emphasizes how to 'push' innovations out into wider practice. Knowing more about demand can only help us strengthen the response of managers, innovators and curators to the clinical needs at the frontline. The study broadens our understanding of how people find new answers to everyday challenges in healthcare delivery. While we have found much that is encouraging – including how strongly patient needs drive the search for innovation – we have also found that the perceptions of leaders and FHWs, between systems and across countries, can be disconnected. Closing these gaps can do a great deal to improve success in the search for new ways of working and ultimately transform systems of care to improve patient outcomes.

We hope that this report will help deepen the collective understanding of what can be done to sharpen the focus in our search for effective healthcare innovations. We also aim to provide useful guidance for organizational health leaders and FHWs who are seeking improvements in their own health systems.

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EXECUTIVE SUMMARY

This research is part of the ongoing study of GDHI. The diffusion or spread of innovations over time through a specific population or social system is important to unlock the potential benefits of an innovation. There has been much study of how to encourage the uptake of innovations so that they become part of everyday practice and benefit many, rather than a few. In this research, we explore this from the demand side. We explore how FHWs and leaders find solutions to their everyday challenges, and which sources are the most influential. We consider how these groups are sourcing solutions to their problems in six countries and how healthcare organizations can source innovations more effectively to meet the needs of FHWs and leaders. The study also explores the role that 'curator organizations' – a specialized set of organizations that source innovations from around the world – are playing in helping to diffuse innovations into clinical practice. We consider what role these organizations could play in future to ensure that they are relevant to frontline needs.

The study builds on previous findings from 2013 GDHI research that showed how certain system characteristics, enablers and frontline behaviors are critical to diffusion.[1] It follows on from the 2015 GDHI study that assessed the importance and prevalence of these elements in eight case studies of rapid, successfully scaled innovations.[2] This year, our study focuses on how FHWs and organization leaders source innovation in the first place.

Our research draws on quantitative surveys of more than 1,350 FHWs in major urban centers of six countries (England, the United States (US), Qatar, Brazil, India and Tanzania). We conducted more than 90 personal interviews with healthcare leaders in these locations and in-depth conversations with the managers of 10 curator organizations.

Need for innovation

The study first explored the most pressing needs and challenges faced by FHWs and healthcare leaders in their respective health systems. The needs most often mentioned by FHWs relate to how the delivery of care is managed. Challenges such as managing patients with multiple conditions, ensuring appropriate care in the right location, standardizing care, and integration between levels of care, are each mentioned by more than seven in 10 FHWs overall across the six countries studied. Issues that have an impact on patient experience – such as engaging patients in managing their own care, waiting times and complexity of the patient journey – are mentioned by about two-thirds of participants. While quality and safety issues are mentioned less frequently, these are far from being negligible areas of need, with issues such as adverse event reporting and over-diagnosis/over-treatment mentioned by more than half of FHWs.

It is clear from the survey of health workers, and also from the interviews with leaders, that healthcare organizations in each country are grappling with a very specific set of needs.

In **England**, healthcare leaders are concerned with finances – a result of funding cuts. This is increasing demand on services and creating constant pressure to deliver to national performance targets. In this context, generating cost efficiencies through means such as service design and securing an organization's financial sustainability are chief priorities. A second commonly mentioned challenge relates to the changing profile of the 'customer' that these organizations serve. Factors such as the aging population and the increasing number of complex cases mean that a new level of integration and collaboration between different departments is required, as well as continuous and appropriate training for frontline staff.

In the **US**, changes to healthcare financing under the Affordable Care Act require new processes and a shift in organizational culture as healthcare leaders become acquainted with the new systems. Care delivery is top of mind for FHWs, and doctor–patient communication is also frequently identified as an issue requiring improvement. FHWs in the US identify financial burden for the patient as a key concern.

Leaders in **Qatar** emphasize the need to maintain the highest levels of service, keeping up with the best international standards, to gain a competitive advantage. While FHWs identify delivery of care issues as particular areas of need, doctor–patient communication is also frequently mentioned. This may relate to linguistic and/or cultural barriers, given the high proportions of expatriate staff making up the medical workforce in Qatar.

Brazil is faced with serious economic troubles as well as serious national health threats in the form of the Zika, Dengue and Chikungunya epidemics. Preventing readmission to hospital is a particular concern, as is reporting adverse events. For leaders in Brazil's increasingly stretched public hospitals, shortages of financial and human resources are particular concerns, leading to high staff turnover. Consequently, FHWs are overburdened and work in unfavorable conditions. For leaders in Brazil's private hospitals, the major areas of need revolve around ensuring efficient management and maintaining high-quality patient care.

Standardizing care is a need often highlighted by FHWs in **India**, as is doctor–patient communication. While leaders recognize that they need to be competitive and keep upgrading their offer, scarce financial resource is a barrier to modernization and investment. There are also difficulties recruiting and retaining skilled personnel. Leaders identify excessive workload and salary expectations as particular problems. They note that frontline workers often lack 'soft skills' such as communication and interpersonal skills, to deal with patients and their relatives.

While FHWs in **Tanzania** identify delivery of care as an issue, financial burden for the patient is the most prominent area of need. Leaders highlight staff shortages, a lack of technical skills and low staff motivation as major problems for their operations. They emphasize that frontline staff are often demotivated due to factors such as workload, a lack of equipment and shortages of medication, which adversely affect their relationship with patients.

Sources of ideas

Understanding where FHWs find solutions to everyday challenges can provide insights into how innovations are adopted and diffused across systems. One thing is clear – FHWs hold huge potential for improving healthcare delivery. Nine in 10 FHWs report having faced a situation in the past year where they wanted to change a way of working. Two-thirds report having had an idea in the last year that could improve clinical practice and outcomes for patients. From a **grassroots innovation** perspective, this is very encouraging. FHWs should be supported to effect needed changes in the delivery of healthcare.

Our research shows that FHWs most often source ideas close to home. Professional colleagues are the most important source and FHWs mainly get their ideas from their own clinical specialty. Three-quarters indicate that they have found ideas from practice outside their organization. However, only one in 10 have found ideas from other countries. There is clearly a need to stimulate a pursuit of solutions beyond one's own discipline.

One surprising finding is that patients are cited almost as frequently as professional colleagues as sources of ideas for FHWs. Recognizing that patients are an important source for ideas to improve healthcare is part of the **open innovation** agenda – ideas and solutions can come from anywhere. We found, however, that individuals and organizations established to promote and diffuse innovation – such as industry representatives and curator organizations – have relatively insignificant influences for FHWs. Very few noted the importance of these groups in inspiring their ideas to improve healthcare in the last year.

There is very little evidence of **reverse innovation** taking place – that is, the idea that high-income countries (HICs) can learn from and adopt innovations from low- and middle-income countries (LMICs). Although FHWs in Qatar, India and Tanzania do cite several middle-income countries (MICs) as useful sources of ideas, low-income (LICs) countries are hardly mentioned at all. Given that there are many innovations coming from LMICs, this is a missed opportunity to potentially improve healthcare provision, even in high-income contexts.

There is clear alignment between healthcare leaders and FHWs about which countries are useful sources of innovations, and the US was most frequently mentioned as a useful source of ideas. However, there is no single country that is outstanding across the board; rather, different countries are seen as valuable sources of ideas in particular areas of healthcare performance, such as the US for technology, Spain for integrated care, and Japan for surgery.

Innovation responsibilities

Our results show that the majority of FHWs feel that clinical staff have at least some responsibility at all stages of the innovation journey, from identifying issues and areas where change and improvement are needed through to identifying and implementing

solutions. They can also help to ensure a culture of openness to innovation within their organizations. However, implementing solutions is considered to be predominantly managers' responsibility.

Most FHWs who report having ideas to improve clinical practice and outcomes for patients say they have gone on to discuss their idea with a manager or other senior member of staff. Almost as many have suggested a possible solution as part of this conversation. According to healthcare leaders, the discussion of solutions is a crucial point in the innovation process; they describe how a solutions-focused approach is key to enabling innovation to take place. They also emphasize that encouraging FHWs to consider solutions to the issues they raise about performance or need is an important aspect of fostering a culture of innovation.

Strategic leadership is also important in encouraging the spread of ideas, underlined by the finding that FHWs working within organizations with a strategy for changing working practices are more likely to demonstrate innovative behaviors. While two in three FHWs report that their organization has a strategy for introducing changes to working practice to improve patient outcomes, this varies across countries. Health workers in HICs are less likely to say that there is a strategy. This is significant, given that previous GDHI research has highlighted the importance of a clear vision and strategy in promoting the rapid diffusion of innovation.

Curator organizations

A diverse set of 'curator' organizations source innovations from around the world, but there is little awareness of such organizations among FHWs or leaders. The organizations tend to focus user engagement on specialist audiences – such as funders, policymakers, researchers or innovators – rather than on engaging FHWs directly. As a result, curators are unlikely to be aware of frontline needs, which may result in a gap between the supply of ideas that curators promote and the needs of FHWs.

Recommendations

While it is difficult to provide recommendations that suit all countries in this study, there are broad trends and common issues around innovation diffusion. These include:

- The needs of FHWs and healthcare leaders must be understood on both sides. Efforts must be made at an organizational level to align these needs to create an effective, system-wide strategy. New innovations for care delivery must be introduced within the context of resource and organizational constraints.
- Health workers and leaders should welcome unusual sources of innovation. Patients can offer timely and relevant insights to improve healthcare delivery. Equally, sectors unrelated to healthcare, such as retail or aviation, can provide comparable lessons for improved management of healthcare and patient safety.

- Seemingly disconnected contexts, mainly those of LMICs, can offer HICs simple and cost-effective – but potentially disruptive – healthcare delivery models and technologies for better health outcomes.
- Effort must be made to engage junior staff in the innovation process. They often have very good ideas but are least likely to bring these forward or to implement them. FHWs working in management positions are more likely to have an innovative idea and be able to align clinical and managerial needs.
- Curator organizations could be pivotal to the flow of ideas in healthcare. They can ensure a bespoke match between healthcare needs and the global supply of innovations, including from LICs. By acting as 'stewards' of innovations, curators can help healthcare organizations to engage with ideas from far beyond their own area of practice.

Recommendations related to specific members of the healthcare community

- Health leaders, senior managers and executives should:
  - develop and communicate a strategy for innovation, including sourcing and adopting it across their organizations. They should embrace relevant curation as part of the strategy.
  - identify the system-wide needs in their organization that address clinical and organizational challenges. This would be supported by ensuring that junior or mid-grade doctors participate in forums with healthcare leaders and service users to identify clinical innovations that benefit the whole organization.
  - develop international health partnerships with hospitals and other clinical services in LMICs. They should ensure that clinicians and managers are engaged in a genuine learning process with the partner organization and actively seek to pilot innovations from other countries.
- Frontline healthcare workers should:
  - provide a systematic and purposeful debriefing to managers to share and learn from innovative models of care from other countries.
  - develop effective networks with colleagues in other regions to share experiences and practice, organizing at least one workshop or conference each year to learn how specific clinical challenges are being addressed elsewhere.
  - take advantage of international health partnerships and other opportunities to work and volunteer in other countries, particularly LMICs wherever possible.

- Curator organizations should:
  - offer a more bespoke stewardship role, acting as a concierge to source innovations from a wide range of countries that best meet the needs of the client's health system.
  - gauge the impact of their work, not just by measuring online traffic or database size, but also by actively monitoring whether innovations are spreading beyond their initial intended market.
  - deepen their engagement in countries where they are not embedded in health systems by working with partner organizations and networks that can act as 'multipliers' for innovations. This would allow diffusion of ideas to a wider audience and also enable frontline needs to inform research.
- Health ministers and other governmental health system leaders should:
  - invigorate overseas clinical and managerial missions, particularly to LMICs. By working with professional medical colleges and postgraduate clinical boards, and by providing specific funding schemes, overseas clinical and managerial roles should be accredited and contribute to postgraduate training.
  - apply lessons from comparative policy analysis and fund pilot schemes of innovative care models that emerge. Governments should pilot innovative care models, technologies or processes in academic health science networks to multiply their effects.
  - provide funding schemes to implement innovations from overseas, with robust evaluation of the lessons learned.

SECTION 1: BACKGROUND TO GLOBAL DIFFUSION OF HEALTHCARE INNOVATION

The GDHI study is an ongoing research program at the Institute of Global Health Innovation (IGHI), Imperial College London. The program seeks to deepen our understanding of the factors that can facilitate the rapid adoption and diffusion of innovations across health systems. Our aim is to build a strong evidence base for learning, so that others can translate successful practices in their own healthcare organizations. This is to achieve a more systematic and rapid uptake of new policies, products and ways of working that result in improved patient and community outcomes (see Appendix 1).

In the last few decades, health services around the world have seen a proliferation of innovations aimed at enhancing life expectancy, quality of life, preventative care, diagnostic and treatment options, as well as the efficiency and cost-effectiveness of the healthcare system. Yet experience shows that it is simply taking too long for many of these new ideas to enter into practice. Even where evidence-based innovations are successfully adopted in a hospital or clinic, they often fail to spread more widely across the health system.[3]

Policymakers and healthcare leaders are wrestling with the problem of how to accelerate the uptake of new innovations and increase the scale and pace of diffusion.[4] Many have considered the attributes of innovations, the characteristics of groups of adopters, the decision-making process, and wider contextual and environmental factors.[5, 6] These frameworks can help forecast the likelihood of, but do not guarantee, successful diffusion. There is insufficient understanding of how organizations can exploit innovations, address the barriers, and effectively plan to adopt and manage necessary organizational change.

The focus of diffusion of innovation research has been on the supply side of innovation – how to 'push' innovations out into practice. However, some simple questions remain to be answered. When healthcare workers perceive a problem in their practice and identify a solution that suits their needs, where do they get these ideas from? What sources do they turn to? How far afield do they look? Who, or what, is influential in shaping the ideas that healthcare workers have to change their everyday practices? These questions focus on the 'pull' for innovation and are demand-driven.[7, 8] By examining this side of the diffusion process, we may be able to shed light on the channels of influence that are most important for healthcare workers.

In other industries, market forces drive organizations to develop strategies to improve the supply of innovation, especially from external sources.[9] This can be on a continuum from identifying raw ideas to considering market-ready products. There are many different intermediary organizations that facilitate this process.[10] Sourcing innovation has been described as involving three things:

1. linking external innovation to strategy;
2. defining what the organization wants to access externally; and
3. leading cultural change.[11]

In healthcare, a disproportionate amount of resource is used to develop new ideas; less consideration is given to successful adoption by the wider system. Even less time is allocated to matching the needs of an organization to the best solution, which can also be considered 'innovation sourcing'. Where we look and how we search for innovations will determine what we find.[12]

Recently, a multitude of organizations, known as curator organizations, have emerged. These organizations are specialist knowledge hubs that support sharing ideas about innovations in healthcare. They mainly focus on identifying valuable innovations from around the world to adopt in their own healthcare contexts. However, little is known about how they identify innovations, what criteria and which sources they use. Little is known about whether their databases are useful repositories for good ideas. And it is uncertain whether they are effective at spreading innovations in their own health systems. As organizations that often operate outside the healthcare system, how relevant are they to healthcare workers?

Our research questions in this GDHI study are supported by recent literature that concerns three sources of innovation: grassroots, open and reverse.

Grassroots innovation

Frontline staff in healthcare organizations often feel powerless to propose changes or improvements to health systems. Grassroots innovation helps frontline voices to be heard, rather than the usual top-down imposition of change. In England, one successful National Health Service (NHS) initiative, NHS Change Day, encourages staff to submit 'pledges' for change in the health system. Over three months, staff submitted 189,000 pledges, which highlights the energy and enthusiasm of frontline health staff (see Box 1).

To date, healthcare improvement efforts have relied on top-down approaches to change.[13] Yet, evidence from policy and social science literature suggests that "bottom-up, locally led, grassroots social movements might offer a complementary approach to healthcare improvement thinking and practice."[14] Many innovation theories and policies are top-down in practice, despite promoting decentralization and inclusion. Bottom-up innovation approaches require an alternative theory and practice of innovation. Yet, little empirical work has been done to study the dynamics of bottom-up innovation approaches, including grassroots innovation. In the context of healthcare organizations, FHWs represent grassroots participants, alongside patients, peer support groups, and community-based organizations. The GDHI study sought to provide insights into the needs and challenges of FHWs, and how more senior health personnel can tap in to frontline contributions.

Box 1: Grassroots innovation – NHS Change Day

In 2013, a group of young doctors on a leadership course shared their frustrations about driving change in the NHS. In March 2013, they launched NHS Change Day, asking the 1.3 million people who engage with the NHS, including clinical and administrative staff and volunteers, to publicly make 'pledges' for change. In a few months, 200,000 pledges were recorded. A pediatrician pledged to "work with the hospital pharmacy to improve the taste of medicines prescribed to children" and the CEO of an NHS Trust to "visit patients in our hospitals who do not have any other visitors". NHS Change Day is now run annually through NHS Improving Quality, an initiative that aims to be "the driving force for improvement across the NHS in England". An evaluation conducted by the Centre for the Evaluation of Complexity Across the Nexus (CECAN) revealed that new change approaches call for new evaluation methods which look at *what's going on* in addition to *what works*.

Source: NHS Improving Quality (2013)[15]

Open innovation

Open innovation overturns the traditional model of innovation, which assumes that only the professionally qualified have expertise. Much innovation in the 20th century was based on the control of creation and management of ideas, requiring investment in internal research and the development and protection of intellectual property. In closed innovation, excellence is assumed within organizations, and the 'not invented here' attitude perceives outside ideas as less reliable. Since the early part of the 21st century, proponents of open innovation[16] argue for greater use of external knowledge sources for inspiration, value creation, lower costs of research and development, and improved quality. Open innovation is based on the increasing mobility of skilled workers distributing their knowledge. It also relies on the expertise of other stakeholders, such as customers, suppliers, collaborators and competitors.[17] Research suggests that open innovation practices in healthcare can advance innovation by including the general public in healthcare research.[18] It challenges the assumption that only skilled people can devise, develop and disseminate new solutions in healthcare; rather, healthcare can involve the general public in generating new ideas. An increasing number of open innovation platforms are helping innovators to engage with a wide range of stakeholders (see Box 2). Patients are closest to the point of care and may know best what improvements are needed. In this study, we investigate how prevalent open innovation approaches are among FHWs and healthcare leaders. This challenges the notion that healthcare professionals are solely able to devise, develop and disseminate new solutions in healthcare. While closed innovation is still predominant across most sectors, open innovation is gaining traction and there is ongoing research on the advantages and disadvantages of each, and which approach will dominate in future.[19]

Box 2: Open innovation

OpenIDEO is a global community working together to design solutions to the world's biggest challenges. An online innovation platform enables anyone in the world to contribute. Challenges are devised by IDEO, the international design and consulting firm, in collaboration with sponsors and partners to ensure that they are human-centered and feasible. At the end of a challenge, the top ideas are chosen for potential piloting and implementation.

Researchers have been examining the potential of open innovation platforms, like OpenIDEO, to expose a local innovation process to a greater number of ideas and a more inclusive set of stakeholders. In partnership with Sutter Health, a non-profit health system in California, OpenIDEO is running an online innovation challenge on reimagining the end-of-life experience. The challenge will run for three months, enabling an international community of online participants to contribute ideas and obtain feedback. The Health Innovation Exchange (HELIX) Centre, based at Imperial College London, is sponsoring a challenge as part of their ongoing effort to develop novel and effective solutions that improve clinical experiences at the end-of-life.

Reverse innovation

Reverse innovation occurs when models of care, technologies, procedures and products, come from resource-poor contexts, such as LMICs, and are implemented in high-income country health systems. Reverse innovation, albeit a term that can appear paradoxical,[20] challenges the assumption that HICs are best at innovating. In any country, when resources are scarce, leaner, more efficient models are needed, wherever they are from (see Box 3). LICs are increasingly developing novel innovations in healthcare and there are multiple opportunities to learn from these countries, for example, around improved surgical procedures,[21] improved long-term outcomes in mental illness,[22] improved skills mix in primary care and the scaling of community health workers.[23]

In Brazil, the Family Health Strategy uses 250,000 community health workers to provide 'cradle-to-grave' health promotion and social care support to more than 65 percent of the population. They visit each household at least once per month, irrespective of need, ensuring a proactive, integrated primary care system that is now the largest publically funded, free-at-point-of-use primary care system in the world. The system has been shown to reduce cardiovascular disease mortality, hospitalizations due to ambulatory care, sensitive conditions and infant mortality at national levels.[24] In Kenya, the Portable Eye Examination Kit (PEEK) makes eye tests affordable and easy anywhere in the world by using smartphones with specialist adapters and software. PEEK Retina is a clip-on camera adapter that produces high-quality images of the back of the eye and the retina for the diagnosis of cataracts, glaucoma and other eye diseases.

However, there are strikingly few examples where these innovations have been adopted in HICs.[25] Lord Nigel Crisp, former Chief Executive of England's NHS, calls for healthcare organizations from HICs to co-develop ideas with LICs.[26] To counter the more traditional flow of ideas and expertise, reverse innovation can challenge beliefs and expectations about the value of innovations from low-income health systems. The well-established influence that the country of origin has on a product is also true for healthcare.[27, 28] Attempts to bring ideas from low-income to high-income countries are often discounted early on and challenges arise from the low-income country cue.[29, 30] In this study, we examine whether FHWs and managers do indeed consider these contexts as useful sources of innovation.[31]

Box 3: Reverse innovation – Operation Hernia

Operation Hernia is an independent, not-for-profit organization founded in 2005.[32] It provides professional and educational opportunities for surgeons and trainees to treat long-standing groin hernias at hospitals in rural areas in Africa and the developing world. It aims to provide high-quality surgery at minimal costs to patients with limited means.

By using mosquito netting instead of traditional surgical netting in groin hernia repair surgery, Operation Hernia is able to lower the costs of surgery dramatically – mosquito netting is 4,000 times cheaper and has been shown to be just as affective. Operation Hernia carries out surgeries at the Hernia Treatment Centre, at Takoradi Hospital in Ghana. Teams of surgeons visit several times each year to operate on 50 to 100 patients. The Hernia Treatment Centre now employs one local surgeon, two nurses, one laboratory technician and one pharmacy staff member full time.

Operation Hernia is now working on several other sites in Rwanda and Ghana, with a target of providing better hernia treatment in the rural areas of Africa.

SECTION 2: METHODOLOGY

In this study, we investigate how healthcare organizations source innovations to meet the needs of FHWs and leaders.

The study was commissioned by the Qatar Foundation and undertaken by Ipsos MORI in partnership with the IGHI.

We ask: whether innovations are sourced from the ideas and needs of the front-line workers; whether new frontiers, such as LICs, patients and curator organizations, are being accessed for inspiration; and whether the needs of frontline staff and healthcare leaders are aligned in the search for new ideas and solutions. We examine this through the experiences of FHWs and leaders in six countries – England, the US, Qatar, Brazil, India and Tanzania.

Ipsos MORI surveyed a wide range of FHWs in each of the six countries. Interviews were also conducted with senior healthcare professionals across the industry – that is, those who are responsible for planning and providing health services and managing performance. When selecting the countries to be involved, several criteria were considered, including geographical coverage and World Bank classification.

- High income – England, the US and Qatar
- Middle income – Brazil, India
- Low income – Tanzania

The research program consisted of three strands: a survey of FHWs; qualitative in-depth interviews with healthcare leaders; and qualitative in-depth interviews with curator organizations. A maximum of four, large urban centers in each country were selected for the survey and the qualitative interviews, to gain comparative insights between these elements. Further details on each strand are provided below (see Figures 1 and 2). A more detailed overview of the methods used and the design of the study is provided in Appendix 2.

Figure 1: Overview of surveys with frontline health workers

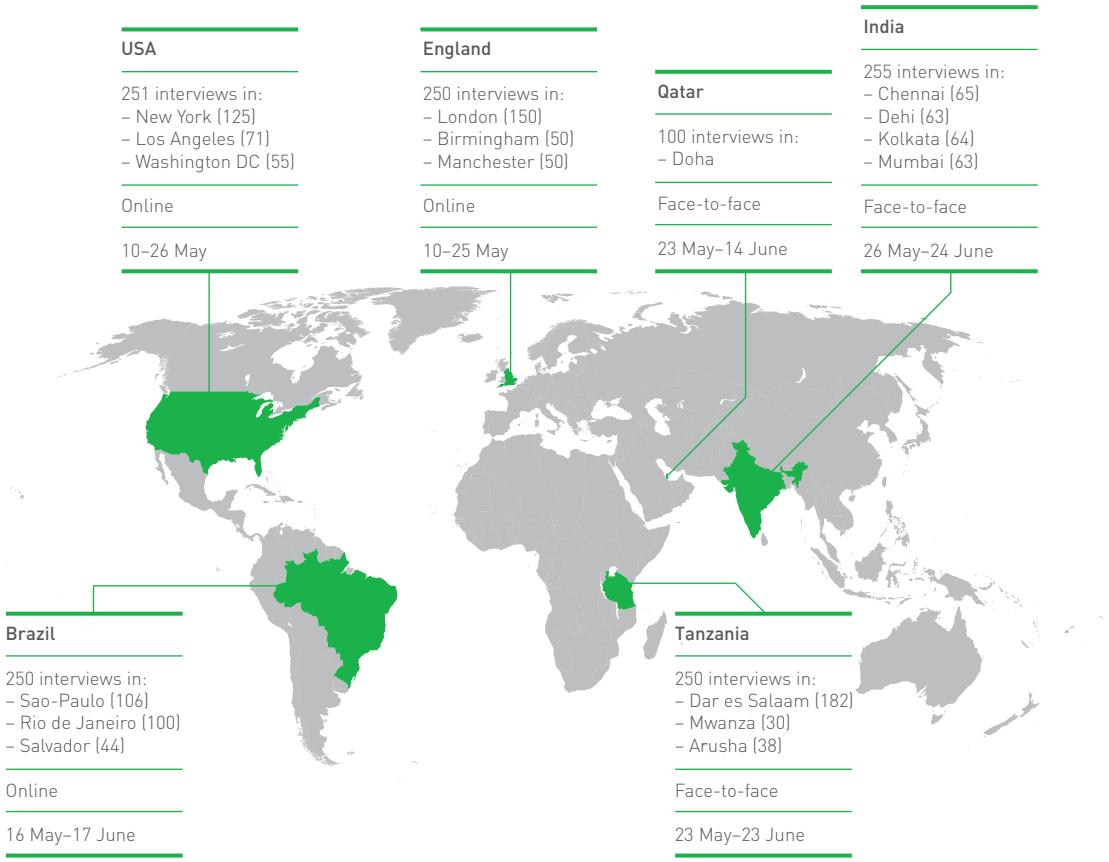
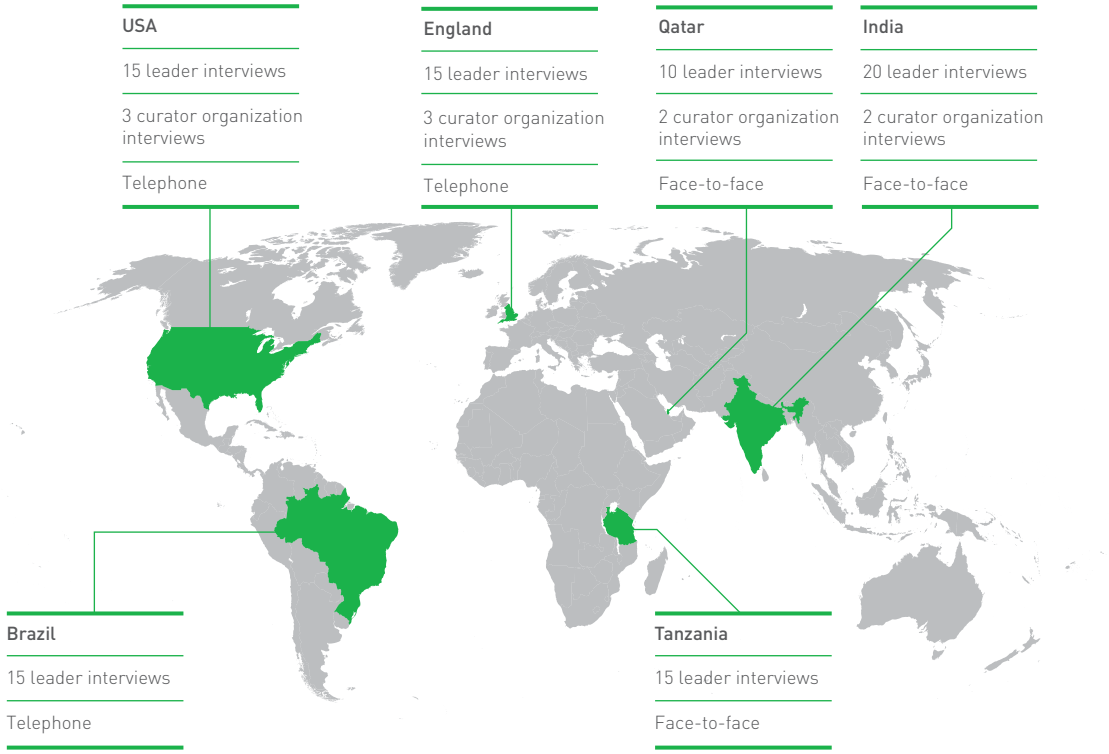


Figure 2: Overview of interviews with healthcare leaders and curator organizations



SECTION 3: RESEARCH FINDINGS

How can healthcare organizations source innovations more effectively to meet the needs of FHWs and leaders? Our research first looks at the needs of FHWs and leaders in the six countries, from both groups' perspectives. We examine how ideas are sourced, where FHWs and leaders look for ideas, and to what extent grassroots, open and reverse innovation are taking place. We describe what the search-and-adoption process looks like and the level of responsibility taken by FHWs at different stages of the process. Then we discuss the relevance of curator organizations in sourcing innovations and how their work might have a greater impact on the frontline of healthcare in future.

In each section the views of FHWs are presented first, followed by the views of healthcare leaders. When we look at the role of curator organizations, we take the perspective of organization representatives. While we mainly look at overall findings, country differences are pointed out where relevant. Summaries of country-specific findings are included in Appendix 3.

The need for innovation

To understand how healthcare organizations can more effectively source innovations to meet their needs, we first need to map out what those needs are. We presented FHWs with a list of different issues related to healthcare provision and asked them to indicate to what extent they agree that improvement is needed in their organization in each area.

These issues can be grouped into three major areas (see Table 1):

- Delivery of care
- Patient experience
- Quality and safety.

Table 1: Potential issues in healthcare organizations

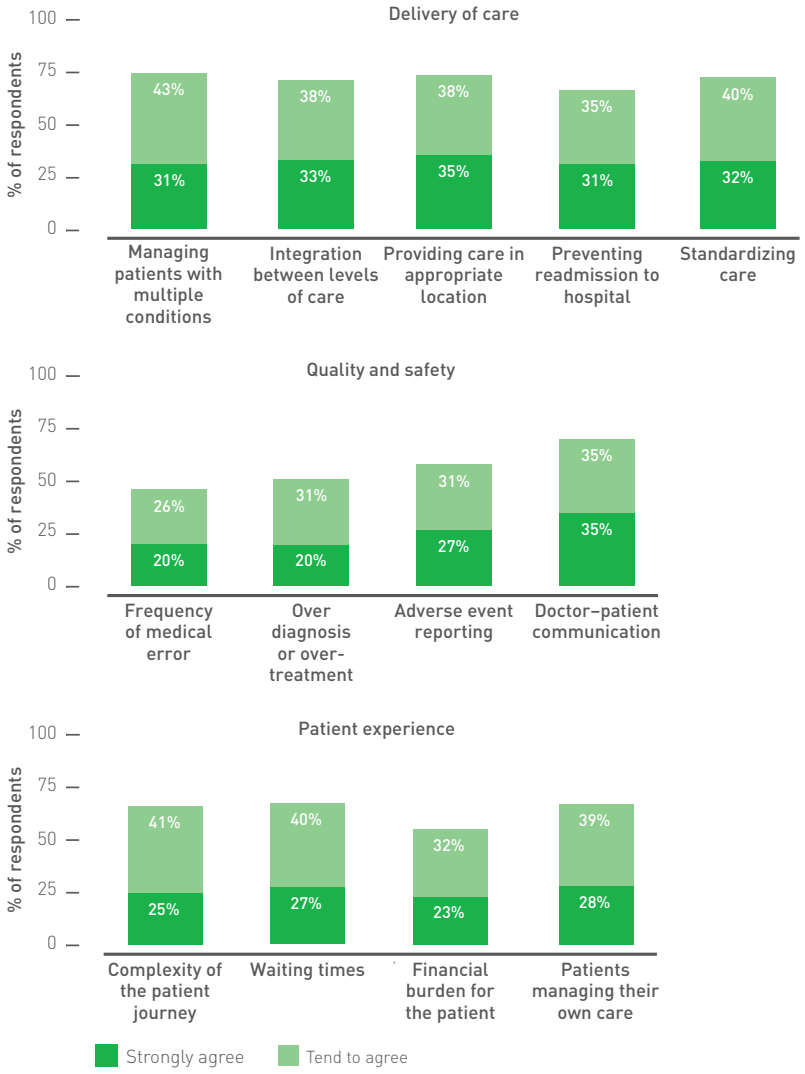
Delivery of care	Patient experience	Quality and safety
Integration between levels of care	Complexity of the patient journey	Frequency of medical error
Ensuring appropriate care in the appropriate location	Waiting times for appointments or procedures	Over-diagnosis or over-treatment
Prevention of readmission to hospital	Financial burden for the patient	Adverse-event reporting
Standardizing care	Engaging the patient in managing their own care	Doctor–patient communication
Management of patients with multiple conditions		

We also asked healthcare leaders to tell us about the main challenges or issues facing their organization in general. 'Averaging' the healthcare needs across six countries with different cultures and healthcare systems is of limited value because the challenges reflect each respective health system and need to be analyzed in that context. However, some broad trends were noticeable.

When we looked at the responses from FHWs across all six countries, issues around delivery of care were most often identified as areas for improvement. (Unless otherwise stated, all percentages refer to FHWs who tend to 'agree' or 'strongly agree' that an issue needs improvement in their organization.) Nearly three quarters of FHWs across the six countries in the study identify management of patients with multiple conditions as an issue that needs improving in their organization (74 percent); a similar number cite ensuring appropriate care in the appropriate location (73 percent), standardizing care (72 percent) and integration between levels of care (71 percent) as other areas requiring improvement.

Preventing readmission to hospital – another issue related to care delivery – is a concern for 67 percent of FHWs (see Figure 3).

Figure 3: Most important issues within healthcare organizations



Base: 1,356 interviews with FHWs

Issues affecting patient experience tend to be identified less frequently than those related to care delivery, but they are quite prevalent: engaging the patient in managing their own care, waiting times for appointments or procedures, and complexity of the patient journey are mentioned by about two-thirds of FHWs overall (67 percent, 67 percent and 66 percent respectively).

Doctor–patient communication is a high-ranking concern, with 70 percent of FHWs mentioning it. However, quality and safety issues are less commonly identified as needing improvement – adverse event reporting and over-diagnosis/over-treatment are mentioned by 58 percent and 51 percent respectively, while frequency of medical error is, on average, the least frequently mentioned issue across the six countries (46 percent). Though less likely to be identified, these types of issues are quite prominent at the global level. With the exception of Qatar (we discuss country differences later in this section), a considerable proportion of FHWs in each of the other five countries agree that frequency of medical error is an issue that needs improvement, reaching as many as 59 percent in Brazil and the US.

Findings for each country

Specific country-level findings are detailed in the following pages.

England

FHWs say a major challenge is the delivery of integrated care to patients with multiple conditions.

The response pattern among English FHWs resembles the 'average' picture, with greater concern around issues of delivery of care, in particular *management of patients with multiple conditions* (71 percent), *integration between levels of care* (71 percent) and *prevention of readmission to hospital* (70 percent). This is matched by some aspects of the patient experience, such as *engaging the patient in their own care* (70 percent), *complexity of the patient journey* (70 percent) and *waiting times* (68 percent). Although *doctor–patient communication* is not as high-ranking an issue as it is in the US, India and Brazil, it is still mentioned by a majority, with 56% raising the issue. Other issues related to quality and safety are mentioned with similar frequency: *adverse event reporting* is mentioned by 58 percent and *over-diagnosis/over-treatment* by 53 percent. Frequency of medical error is of less concern – 44 percent identified it as an issue. Only 3 in 10 (28 percent) FHWs in England cite *financial burden* for the patient as an issue that needs improving, the lowest proportion of all six countries in the study.

Healthcare leaders recognize the challenges of an aging population and increasingly complex cases; however, finances are the leading concern.

Healthcare leaders in England say that they are mostly concerned about the financial challenges facing their organization. These challenges are the result of funding cuts, increasing demand and constant pressure on delivering to national performance targets. Generating cost efficiencies (through service redesign, for example) and securing the organization's financial sustainability become priorities. A second commonly mentioned challenge relates to the changing profile of the 'customer' these organizations serve – the aging population and increasing number of complex cases (multiple co-morbidities) require a new level of integration and collaboration between different departments, as well as continuous and appropriate training for frontline staff.

> *"Well by far the biggest challenge is the finances, essentially. We do more work than we're paid for …"*

> *"[Another challenge is] the increasing demand for healthcare services across the board in the hospital, but primarily the growth in the elderly population being admitted semi-urgently and urgently into the hospital."*

The US

Delivery of care issues and doctor–patient communication feature highly in the FHWs survey.

Issues around delivery of care seem to be front-of-mind for FHWs in the US, with *prevention of readmission to hospital*, *management of patients with multiple conditions*, *engaging the patient in their care* and *ensuring appropriate care in the appropriate location* each mentioned by about 70 percent of the surveyed FHWs, and *standardizing care* by 61 percent. *Doctor–patient communication* ranks highly as an issue that needs improving, identified by 7 in 10 FHWs (71 percent). Patient experience issues such as *complexity of the patient journey* and *waiting times* are also frequently mentioned, as is the *financial burden for the patient* (all identified as issues by over 60 percent of FHWs in the US). *Frequency of medical* error ranks higher as an issue than in any other country except Brazil (identified by 59 percent of FHWs). Other quality and safety issues such as *adverse event reporting* and *over-diagnosis/over-treatment* are identified with similar frequency.

Healthcare leaders note that changes to funding under the Affordable Care Act (ACA) require new processes and a shift in culture.

Healthcare leaders mention a wide range of organization-specific issues, reflecting the diversity of organizations and the contexts they operate in. It includes things like managing multiple funding streams, lack of financial resources to meet specific organizational needs, or the specific health problems of the population they serve, such as high incidences of obesity or diabetes, and many others. There are, however, some common themes too. The majority of US healthcare leaders talk about financial challenges that their organization is facing. Healthcare providers need to adjust to the new system of financial reimbursement for care under the ACA. This creates a need for new processes and, crucially, alignment between the clinical and administrative sides of the organization, which employees find challenging. Integration between levels of care and better information sharing within the organization are also increasingly important. Another consequence of the ACA is the relationship between the provider and the patient; customer satisfaction becomes increasingly important as organizations are finding that they need to 'compete' for patients:

> *"The way that our healthcare delivery system currently is paid in the United States has been changing. I think, in some ways, for the better, but in the safety net, we don't really make our money by doing fee-for-service healthcare delivery."*

> *"No, it's not enough to deliver good healthcare anymore. You have to actually, publicly report your outcome measures and you have to have customers or patients that really – they're becoming customers now – who are happy with the type of care delivery, and that's a big culture shift for medicine as a whole."*

Qatar

FHWs indicate that standardizing and streamlining care could be improved.

In line with the global survey findings, issues around delivery of care seem to be the biggest concern for FHWs in Qatar. In particular, *standardizing care* and *ensuring appropriate care in the appropriate location* are mentioned by about 60 percent in the survey. *Prevention of readmission to hospital* is a notable exception among delivery of care issues, only mentioned by 1 in 4 in the survey (25 percent). *Doctor–patient communication* is another frequently identified issue (61 percent); given the highly international make-up of the medical workforce in this country, this might suggest that there are language and/or cultural barriers between medical personnel and patients. Quality and safety issues are not reported to be a great concern. They are some of the lowest-ranking issues with *frequency of medical error* only mentioned by 14 percent, *over-diagnosis/over-treatment* by 27 percent and *adverse event reporting* by 30 percent.

Healthcare leaders highlight the importance of providing the highest standard of service, and note that relying on foreign workers creates administrative as well as cultural challenges.

Qualitative interviews with senior managers reveal a widespread appetite to keep up with best international standards and to keep improving the existing services to gain a 'competitive advantage'. When asked about challenges, some leaders describe success stories of improving their practice or introducing new or better services, as a result of addressing a previously existing issue or unmet need. As one participant observes when describing how the organization introduced the use of contact lenses in their daily practice:

> *"Our target was to introduce something new and become unique in it."*

Healthcare organizations often experience difficulties in hiring and retaining highly qualified doctors, and mostly rely on a foreign workforce. The proportion of expatriate staff creates its own problems as licensing and securing visas can be time-consuming and depends on external procedures (approval by the Ministry of Public Health). The large diversity of backgrounds also means that aligning the skills and working practices of staff, and ensuring all are familiar with the healthcare regulations in Qatar, is time-consuming, costly and challenging.

> *"When you bring a doctor, by the time he gets used to the Qatari culture in order to succeed, he works for one to two years. He could come from a certain university and gets recalled back, then we get a new doctor, which is a huge challenge."*

> *"So we face this issue a lot in understanding the patient. Each patient has a different culture, different language, different symptoms, different temper, so you have to adjust yourself to each patient individually."*

Brazil

Very high proportions of FHWs agree that there are issues affecting the delivery of care in their organization.

Ensuring appropriate care in the appropriate location, *prevention of readmission to hospital*, *integration between levels of care*, *management of patients with multiple conditions* and *standardizing care* were all mentioned by the vast majority in the survey (between 83 percent and 90 percent). *Prevention of readmission to hospital*, in particular, is identified as an issue more frequently than in any other country in our survey. The same is true for *adverse event reporting*, which is also high on the list, with as many as 80 percent of FHWs in Brazil saying that it is an issue. Compared to this, other quality and safety issues such as *frequency of medical error* and *over-diagnosis/over-treatment are* mentioned less frequently; although they are relatively prevalent, identified by about 6 in 10 FHWs (59 percent and 62 percent, respectively).

For leaders in Brazil's increasingly stretched public hospitals, shortages of financial and human resources are particular concerns. The crisis has not spared private healthcare institutions that struggle to remain financially sustainable.

As a consequence of the economic climate, many institutions have postponed major investments in state-of-the-art equipment and stopped expanding their offer. Political and financial uncertainty and difficulties in making forecasts have led to more conservative, risk-averse management strategies. High staff turnover and FHWs being overburdened and working in unfavorable conditions is a concern. Coupled with low pay, it does not attract the most talented and skilled professionals to work at public health institutions. Bureaucracy and lack of empowerment to make decisions are also mentioned as key challenges, with excessive government regulation interfering with the day-to-day management of the organization. In the words of one of the leaders:

> *"[Healthcare is] an area that requires increasing investments and technology is getting more and more expensive, everything is more expensive. So this year, this is what we are going through, I believe that financially speaking we have reached rock bottom.*

> *"There's so much bureaucracy involved in buying a computer ... it's hard to make them understand that a hospital also needs computers."*

India

A number of issues seem to be felt acutely by FHWs in India; doctor–patient communication is one of the biggest concerns.

As many as 9 in 10 FHWs in India agree that *standardizing care* is an issue that needs improving. *Doctor–patient communication* is a very prominent concern – it is also mentioned by 9 in 10 FHWs, while as many as 6 in 10 'strongly agree' that this is an issue that needs improving. The number of official languages in India (there are 22) is likely to contribute to the issue in no small part. Three other very commonly mentioned issues (all raised by more than 80 percent in the survey) are *management of patients with multiple conditions*, *ensuring appropriate care in the appropriate location* and *integration between levels of care*. *Frequency of medical error* is the least identified issue, mentioned by about 4 in 10 (43 percent).

Physical capacity to meet growing demand, combined with financial pressures, are the top-of-mind issues for healthcare leaders.

Healthcare leaders recognize that they need to be competitive and keep upgrading their offer, but scarce financial resource is a barrier to investing. A number of issues related to human resources were also mentioned – staff recruitment and retention, and capacity building. Recruitment of skilled personnel is a challenge across all hospital sizes, as is attrition and high turnover. Graduate doctors who start work in hospitals leave after a short time (six months to a year) to pursue specialist studies or better professional prospects.

The rapidly growing population of India is causing serious capacity issues for many healthcare organizations, in particular large and very large hospitals. Facilities are often old and inadequate, but there is no resource for modernization. Catering to increasing demands becomes very challenging. Financial challenges are another common theme in the qualitative interviews. Hospitals that rely on payments from insurance companies report flaws in the system, which often does not work smoothly due to missing or incomplete paperwork, lack of standard charges, and delays in approvals from insurers.

> *"Actually, our main problem is shortage of space. Now we desperately want to do renovation. We want to put centralized [air-conditioning] but, due to structure of building, we are not able to do that."*

Tanzania

Issues around delivery of care are common, but financial burden for the patient is the most prominent issue, according to FHWs.

Seven in 10 FHWs in Tanzania agree that *financial burden for the patient* is an issue that requires improvement; 4 in 10 'strongly agree', a significantly larger proportion than for any other issue. *Management of patients with multiple conditions* and *standardizing care* are very frequently mentioned – by 68 percent and 64 percent respectively. Quality and safety issues are reported by fewer than half of healthcare professionals in the survey.

Interviews with leaders reveal that human resources issues and inconsistent income are the two main sources of challenges.

Most of the senior managers highlight that a shortage of staff is a major challenge to the operations at their facility. Poor funding and issues related to inadequate payment systems mean hospitals often cannot guarantee staff wages are paid on time. Delayed payment of hospital bills by patients has an adverse effect on timely service delivery. Others also point out that a lack of technical skills and low motivation among staff pose challenges to high-quality service delivery. Poor and/or outdated infrastructure is a common theme, too – there is often an insufficient number of wards, consultation rooms and operating theatres in hospitals. Apart from causing congestion, this minimizes doctor–patient confidentiality and creates an environment that supports the potential spread of communicable diseases.

> *"Here the biggest challenge is staff turnover because we can't always pay wages on time."*

> *"I mean that buildings are few, they are old/outdated. The sewage system is a challenge; it is not sufficient."*

Table 2: Summary of key concerns mentioned by FHWs and healthcare leaders

	FHWs	Healthcare leaders
England	• Integration between levels of care. • Management of patients with multiple conditions. • Complexity of the patient journey.	Increasing demand due to an aging population and increasingly complex cases; however, finances are the leading concern.
US	• Prevention of readmission to hospital. • Management of patients with multiple conditions. • Doctor–patient communication.	Challenges posed by changes to funding due to the Affordable Care Act. Integration between levels of care and better information sharing is also a key priority, but cost is an issue.
Qatar	• Standardizing care. • Doctor–patient communication. • Ensuring appropriate care in the appropriate location.	Difficulties in recruitment and cultural challenges are created by having to rely on foreign workers.
Brazil	• Ensuring appropriate care in the appropriate location. • Prevention of readmission to hospital. • Standardizing care.	Brazil's increasingly stretched public hospitals cite shortages of financial and human resources as particular concerns.
India	• Standardizing care. • Doctor–patient communication. • Management of patients with multiple conditions.	Improving hospital infrastructure and increasing staff numbers to meet growing demand, combined with financial pressures, are the top-of-mind issues.
Tanzania	• Management of patients with multiple conditions. • Financial burden for the patient. • Standardizing care.	Human resources and inconsistent income – leading to difficulties paying staff and suppliers – are the two main challenges.

What are the main sources of innovation?

We asked FHWs from each country whether they had an idea in the last year that could solve a key challenge they were facing in their clinical practice. We asked where they got the idea from and what they did with the idea. This section explores the extent to which FHWs drive innovation in their organizations. We also look at how ideas are derived from outside of the health system, for example, from patients or from other industries, from lLMICs and from curator organizations.

Grassroots innovation – are FHWs leading the charge?

The vast majority of FHWs identified a need to change their way of working. This is related to the size of the organization they work in.

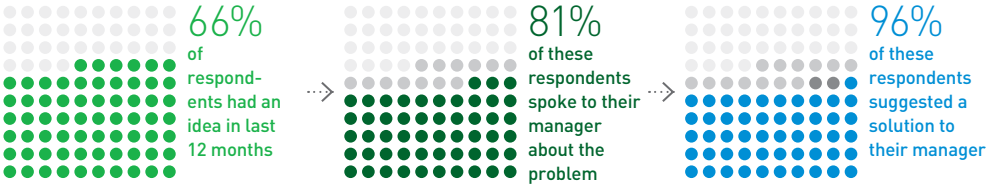
Across the six countries studied, 91 percent of FHWs report identifying something that needed changing in their clinical practice at least once within the last year; 41 percent report identifying a need several times a month. The proportion of FHWs who say they wanted to change a way of working in their organization in the last year is independently associated (i.e. not modified by other factors) with the country they work in. In England (97 percent) and the US (97 percent) almost all FHWs reported wanting to change a way of working within the last year, as did high proportions in Brazil (94 percent), Tanzania (92 percent) and India (87 percent). The proportion was lowest in Qatar, where it was reported by just 65 percent of FHWs.

The likelihood that an FHW had identified a need to change a way of working is also independently associated with the size of the organization. Those working in smaller organizations, with fewer doctors (an average of 88 percent of those in organizations with fewer than 10 doctors) are less likely to report that a change is needed, than those working in organizations with more doctors (94 percent of those in organizations with more than 500 doctors).

A significant proportion of FHWs report having had an idea to solve a challenge in their healthcare practice within the last year.

Our findings show that, across the six countries surveyed, the majority of FHWs are generating ideas for how clinical practice and outcomes for patients can be improved; two in three (66 percent) report having had an idea in the past year for something that could be introduced or done differently within their organization. This is encouraging and indicates that FHWs want to make improvements and are engaging with finding solutions (see Fig. 4). FHWs working within larger organizations (with more than 50 doctors) (73 percent) and those working in secondary care (70 percent) are more likely than average to have had an idea in the last year. The level of specialization and management responsibilities of the individual FHWs also influences their likelihood of having an idea. Non-specialized doctors (54 percent) are the least likely to report having had an idea, while consultants (73 percent) are the most likely.

Figure 4: FHWs as sources of ideas



Base: 901 interviews with FHWs

FHWs working in organizations that have a strategy for changing working practices are more likely to demonstrate innovative behaviors. However, the prevalence of these strategies varies significantly across healthcare systems and organization size.

Certain characteristics were associated with FHWs being more likely to have had an idea to improve their work practices in the last twelve months. It was more likely if they worked in secondary care, in larger organizations, had been at the same organization for more than 15 years and if they spent more than 50% of their time in management activities (see Fig. 5)

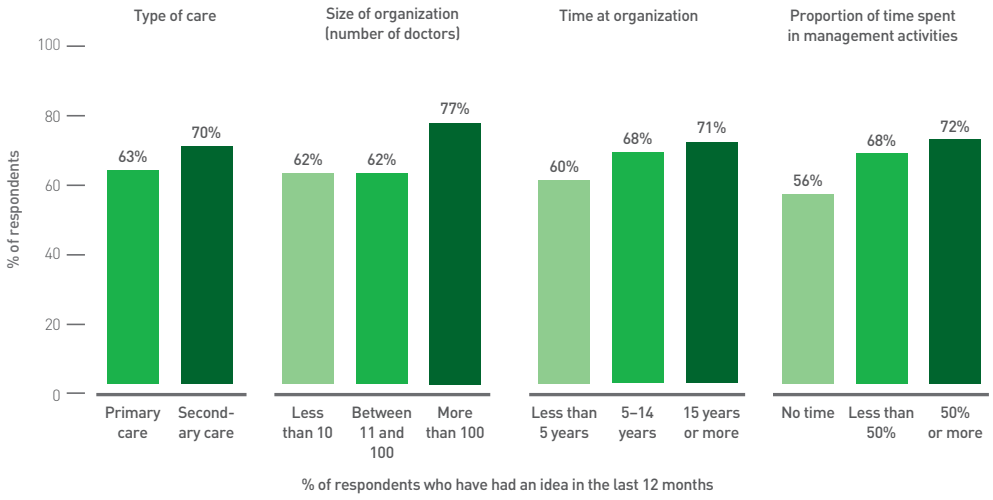
Previous reports in this research series have highlighted the importance of a clear vision and strategy in promoting rapid diffusion of innovation. As such, it is encouraging that two in three FHWs (67 percent) across the six countries surveyed report that their organization has a clear strategy for introducing changes to working practice to improve outcomes for patients. Also, an FHW's awareness of a strategy within their organization affects their behavior towards innovation. Those working in an organization with a strategy for innovation are more likely than those without a strategy to identify a situation where they want to change a way of working (93 percent compared with 89 percent). They are also more likely to have had an idea for improving clinical practice or patient outcomes (70 percent compared with 60 percent) in the past year. FHWs from larger organizations are less likely to report that their organization has a clear innovation strategy, compared to smaller organizations (58 percent in organizations with more than 100 doctors, compared with 72 percent in those with up to 50 doctors). However, some leaders suggest that this may actually reflect lower levels of *awareness* among FHWs working in large organizations.

The proportion of organizations that have a clear strategy for introducing change varies across the countries. FHWs in India (low-middle income) and Tanzania (low income) – the countries with the lowest incomes of those surveyed (defined by the World Bank Country and Lending Groups 2017)[33] – are most likely to report that their organizations have clear strategies (84 percent and 82 percent respectively). Strategies are less frequently reported in higher-income countries; three in five FHWs in Brazil (upper-middle income) (62 percent) and the US (high income) (61 percent) and about half in Qatar (high income) (47 percent) and England (high income) (55 percent) report their organizations having strategies.

FHWs are not as involved as they could be in implementing their solutions to improve practice.

Although the vast majority of FHWs identify a need for change in their organization, only 51 percent of FHWs that we surveyed overall have discussed a solution with their manager to solve a particular challenge or way of working in their healthcare system. However, this represents 77 percent of those FHWs who had an idea to improve their practice. FHWs who are engaged in an improvement agenda seem to be escalating their ideas to senior managers (see Figure 4).

Figure 5: Characteristics of FHWs that have had an idea in the last 12 months



Base: 1,356 interviews with FHWs

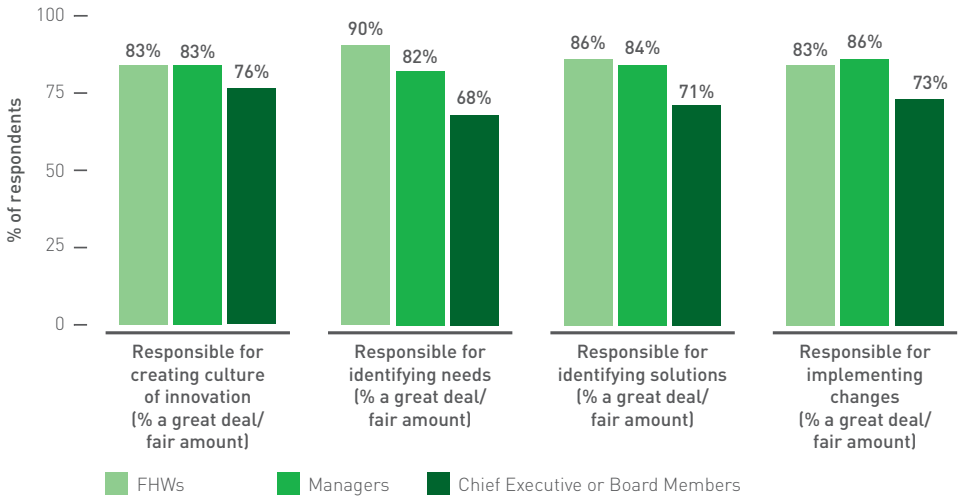
FHWs in Qatar are significantly less likely to discuss issues with their seniors compared to those in all other countries (13 percent versus 54 percent of participants overall). This may reflect either a perception that their organizations are less in need of change, or that the responsibility of the innovation process lies more with senior staff than clinical staff. FHWs in India are also significantly less likely to discuss needs with senior staff (45 percent) when compared with those in Tanzania (61 percent), England (60 percent) and the US (59 percent).

The seniority of the frontline staff themselves has an impact: older participants, those who have worked in healthcare for longer, and those who dedicate a greater proportion of their time to administrative duties are all more likely to have progressed further in the innovation process. This may result from their relative closeness to senior leaders and the strategic goals of their organization, and their occupation of the 'middle ground' between junior staff – who are most likely to identify clinical needs and challenges – and senior colleagues with the power to see changes implemented. FHWs who report working in an organization with a strategy for innovation are also more likely to take a lead in furthering their ideas to improve healthcare in their setting.

Staff at all levels play a part in creating a culture of innovation. However, FHWs tend to feel less responsible when it comes to implementing changes in their organization.

The vast majority of FHWs feel they have some level of responsibility at all stages of the innovation process. However, most prominent is their role in identifying needs (90 percent). They consider themselves to be less responsible when it comes to implementing changes in their organization (83 percent). (See Figure 6.)

Figure 6: Roles and responsibilities as perceived by FHWs



Base: 1,356 interviews with FHWs

The vast majority of FHWs (90 percent) consider themselves responsible for *identifying areas in clinical practice that need improvement.* Perhaps unsurprisingly, this is seen as less of a priority for managerial staff; 8 in 10 FHWs (82 percent) feel that managers have this responsibility and just two thirds (67 percent) believe that the Chief Executive and Board have a responsibility for identifying areas in need of improvement. The vast majority of FHWs see identifying areas for improvement as the role of clinical staff (86 percent) and managers (83 percent). Senior staff are less likely to be considered responsible for this stage in the innovation journey (71 percent). Managers are thought to have more responsibility at implementation stage, with the vast majority of FHWs (86 percent) reporting that this was part of the management role.

The presence of an innovation strategy positively influences FHWs' perceptions of responsibility for innovation.

The prevailing cultural context of an organization has a clear impact. FHWs in organizations that have an innovation strategy are significantly more likely to perceive staff at all levels to be responsible for innovation in their workplace. These differences are evident across all stages of the innovation process – from encouraging a culture of openness to innovation, to implementing innovations. Also, FHWs who believe that their organization actively seeks to ensure improvements are more likely to consider staff at all levels responsible for innovation, at all stages of the process.

Organizations depend less on FHWs to identify solutions than to identify needs but recognize the importance of FHWs 'leading the charge'.

Healthcare leaders report that FHWs have a tendency to be problem-focused, rather than solutions-focused. They recognize the value of involving FHWs in identifying solutions even though, in their experience, FHWs do not take the lead in forging ahead with solutions to the problems they have identified. It is widely felt that the individual who identifies the issues is best placed to identify an effective solution.

However, there is also a feeling among leaders that, while FHWs' involvement in developing solutions is important, it is less crucial than securing their engagement in identifying needs.

"I spend a lot of time with doctors coming to me complaining that something isn't right or that it doesn't work as well as they would like. But when I ask them to get involved with finding a solution to that problem, they're not quite so interested."
England

"I won't be hypocritical and say that it happens all the time, but in most cases we seek to involve the person who made the suggestion, who placed the complaint. Because there's no one better than the frontline person to solve the issue."
Brazil

Our interviews with leaders highlight that many organizations are focusing on devolving responsibilities – including responsibility for budget – to clinical departments. This is creating a flatter structure that empowers staff to identify and implement solutions independently from senior management. The shift is particularly seen in larger organizations and may explain the greater number of FHWs working in these organizations who report that they had an idea to solve a healthcare problem in the past year. Paradoxically, they are more likely to be unaware of an innovation strategy.

"Part of what we're doing around the restructuring is allocating indicative budgets to team leader level. So our chief exec has been really keen that we empower our staff by giving them the autonomy, by giving them the boundaries."
England

"Frontline staff have to own the change. They have to decide what changes to make. They have to champion those changes. It should be their decision about which changes to implement and plan. The role of management is to organize that, but you have to give them leadership and ownership in the project, because they live in this space."
US

"We were lulled into this culture of, 'If it's not happening, escalate it, and then we [senior management] will make it happen'. So we're trying to shift the focus and push that back down. And that's the culture of innovation that we want to run, if we want people to be solutions-focused in everything they do."
England

One way of achieving this, which is mentioned in Brazil, England and the US, is to create a flatter organizational structure, where responsibility, including for budget, is devolved to smaller teams rather than being managed centrally. The impact of this is that FHWs have more flexibility to act quickly on the needs they identify, and to take ownership of solving a problem, without having to defer to management decisions relating to budget or strategy.

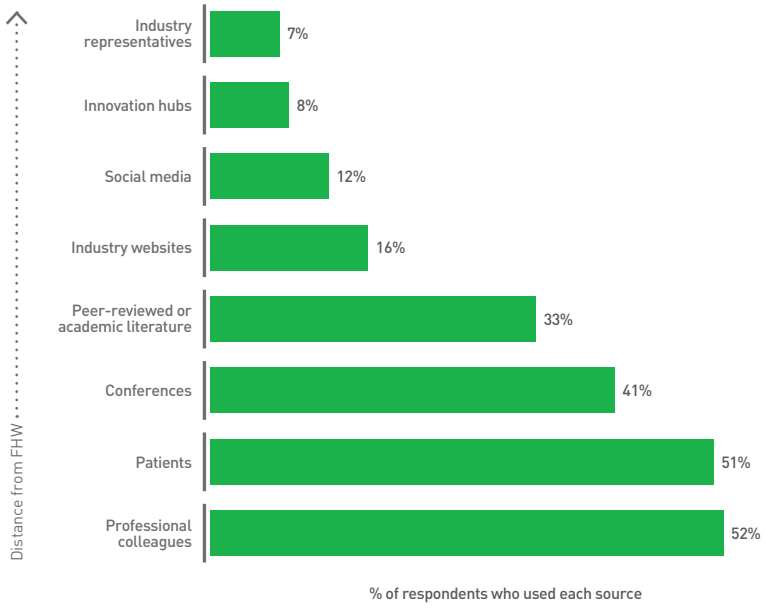
"I think we recognize that many times people feel that their arms are tied behind their back because they haven't got the flexibility, because they don't hold the budget. [But their attitude needs to change.] We'll help you, support you to do it, but actually you've got the ideas, you're responsible for making those changes on the ground."
England

Open innovation – what and who influences FHW ideas?

FHWs most often source ideas close to home – with professional colleagues and patients the most frequent sources.

We asked FHWs who had had an idea to solve a problem in their healthcare setting within the last year, where they felt that idea had come from. This is to examine the sources of information and influence that are most significant in the respondents' experience. Our findings underscore the importance of people – specifically colleagues and patients – as a source of innovation on the frontline. FHWs report that half of all ideas they had in the past year were obtained from either professional colleagues (52 percent) or patients (51 percent). These sources are ranked first or second in all countries, except India, where FHWs report more often using conferences as a source for new ideas than interaction with professional colleagues, and in Qatar, where industry representatives play a more important role as a source than patients do. (It should be noted that this finding is indicative only due to the small number of FHWs (14) answering this question in Qatar.) Conferences and peer-reviewed or academic literature are important sources, but only rank third and fourth as sources of innovation mentioned by FHWs (41 percent and 33 percent respectively). (See Figure 7.)

Figure 7: Where FHWs get their ideas to improve practice from (people and media)



Base: 901 interviews with FHWs

Patients are a particularly important source of frontline ideas – industry and curator organizations feature less frequently.

The finding that patients act as one of the most important sources of innovation for FHWs suggests that they are open to ideas from outside their organization when these are closely related to their clinical practice. Other sources, such as industry websites or reports (16 percent), social media (12 percent), industry representatives (7 percent) and other websites (4 percent), are mentioned less frequently than the top four sources, but do appear to contribute to frontline innovation in all countries studied.

Social media and industry websites are important sources for FHWs in Tanzania. However, it should be noted that this is not uniform across the countries; in England, for example, FHWs make little mention of social media and industry websites as sources. Curator organizations, specifically innovation hubs and databases, are hardly mentioned by FHWs as sources for their ideas, with fewer than 10 percent of FHWs citing them as sources. This finding is consistent across the countries.

FHWs typically are influenced by multiple sources rather than a single source of ideas.

In all countries FHWs report that their idea to improve clinical practice was derived from at least two different sources. This is highest in Tanzania, where FHWs, on average, report using more than three sources (3.2), with those in Qatar (2.7) and India (2.5) also reporting higher than average levels of multiple sourcing. In Brazil (2.2), England (2.0) and the US (2.0), FHWs report using an average of about two sources of innovation for their idea.

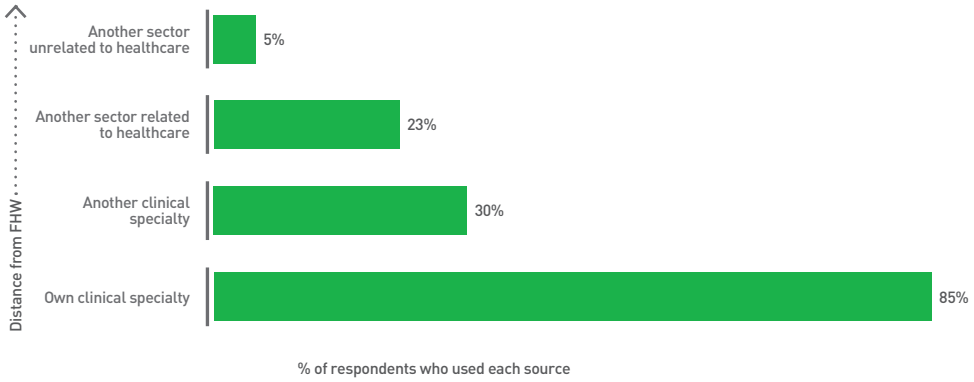
Overall, a quarter of FHWs' ideas are derived from at least three of the four most frequently used sources (professional colleagues, patients, conferences and literature). Some of these top four sources are used in combination more often than others. For example, patients and professional colleagues are very often used together as sources for a given idea, as are conferences and peer-reviewed or academic literature.

Own clinical specialty dominates as a source of innovation. FHWs are influenced by disciplines outside their own sphere of experience, but to a much lesser degree.

An important question is the extent to which FHWs are looking outside of their own clinical specialty to source ideas. Our research shows that the majority of FHWs' ideas for innovation are derived from their own clinical specialty. This is consistent across the countries, ranging from 91 percent in India to 82 percent in the US. Other sources are still relevant, with a third of respondents who had a healthcare improvement idea in the past year suggesting that it came from a clinical specialty other than the respondent's own. Almost 25 percent reported that the idea originated from another sector related to healthcare. In Tanzania and India the proportions are significantly higher (65 percent from another clinical specialty and 39 percent from a healthcare sector in Tanzania; 40 percent from another clinical specialty and 28 percent from a healthcare sector in India). Overall, 40 percent of FHWs who report having an improvement idea report that an external source for their idea, other than their own clinical specialty, was influential. In India and Tanzania, the proportion jumps to

just above 50 percent. Only 5 percent of FHWs report that their idea was influenced by sectors unrelated to healthcare (see Figure 8).

Figure 8: Where FHWs get their ideas to improve practice from (specialty/sector)

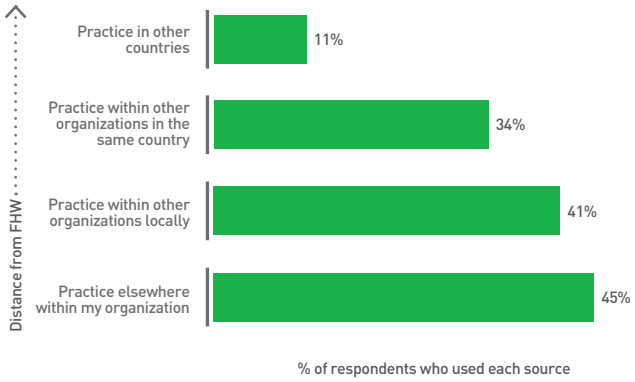


Base: 901 interviews with FHWs

A high proportion of FHWs are sourcing ideas from practice outside their own organization, although their own organization remains the main source.

We asked FHWs who had an idea to improve clinical practice in their healthcare setting in the past year whether the idea came from their own organization, another organization in the same locality, other organizations in the same country, or from other countries. The healthcare organization they work for is most frequently mentioned as a source (45 percent), but clinical practice from other organizations is also relevant. Four in ten FHWs (41 percent) claim they source ideas from other organizations within the same locality, and a third say they do so from organizations within the same state or country (see Figure 9).

Figure 9: Where FHWs get their ideas to improve practice from (organization/country)



Base: 901 interviews with FHWs

Some countries are more likely to find ideas using multiple sources (which may include their own organization, other organizations in the same locality, the same state or country, or those in other countries). In England, the US and Brazil, between 70 and 80 percent of ideas for innovation are sourced from one level only. In contrast, FHWs in India report looking at clinical practice from multiple levels for half of the ideas they mention. This is also the case for 60 percent of the ideas mentioned by FHWs in Tanzania. Only 11 percent of FHWs reported that their ideas were influenced by practice in other countries. Sourcing ideas from practice in other countries is more often mentioned in Brazil, while sourcing *within* the country is more typical in England and Tanzania.

Like FHWs, healthcare leaders stress the importance of colleagues and professional networks in sourcing ideas.

In our interviews with healthcare leaders, they explain that many staff have experience of working in different healthcare organizations or even in other countries. Therefore, they are able to bring fresh ideas about how the organization's healthcare delivery can be improved.

> *"The literature is fine, but the literature really is not as good as having a friend in another institution who has had a similar problem and can tell you how to solve it, because literature only tells you what's on the paper, and you don't get into the specifics and the nuances … So we tend to really talk things out and then reach out to other people and other institutions, as well as read the literature."*
> US

Peer interaction is also a valuable source of innovation. Leaders emphasize that conferences and training sessions organized by professional associations or industry representatives are an important way of learning about new ideas being implemented worldwide. Positive experiences from other organizations also play an important role, particularly where the hospital is part of a larger system, which helps to facilitate interaction and ideas exchange. This is particularly important as a source of ideas from outside a clinical specialty.

In the US, sources such as academic and industry literature, internal communications with staff and patients, consultant relationships and industry guidelines are cited as the most common ways of identifying potential changes and sourcing implementation strategies. In England, working with colleagues across teams is regarded as a good way of developing ideas. This can be seen as the most frequently used approach to finding innovative improvements. Organizations that are part of large systems use experiences from other hospitals within the same system. In India, leaders of hospitals that aspire to expand mention that they source ideas from established hospitals, using their past experiences; others are keen to source ideas from international organizations or hospitals abroad. In Brazil, leaders mention they use academic sources, medical literature, journals, clinical protocols, and websites and search tools. They also attend congresses, symposiums, conferences, trade shows and other events. Clinicians often work in more than one hospital, learning from colleagues and different institutions at a range of developing stages. In Tanzania solutions are sourced on a more improvised basis and tend to come from the senior managers or from other organizations. Leaders in Qatar tend to source ideas from

clinicians who have experience working abroad or being trained in other countries. They also look to guest doctors who are visiting local hospitals to share knowledge.

> *"Bigger changes come from accreditation as well. For example, this year we introduced a lot of risk assessment based on the accreditation requirement, and introducing changes in these things affects the policies and protocols and also affects the tools that we use to determine [these policies and protocols]."*
> Qatar

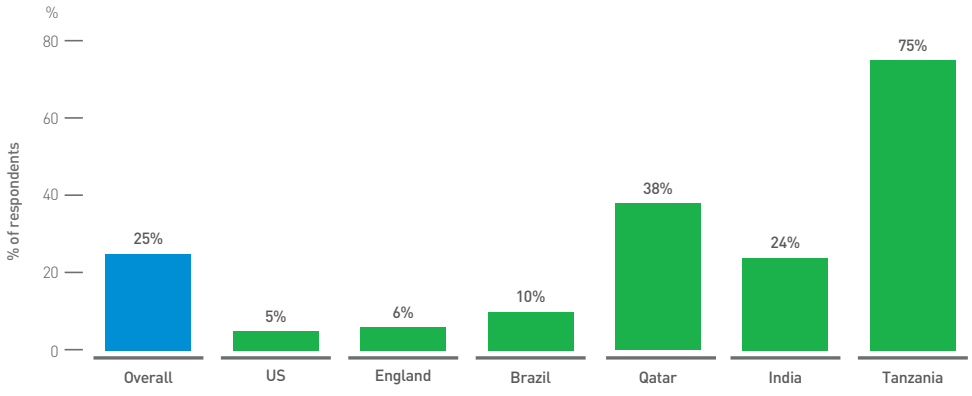
Reverse innovation – are low- and middle-income countries influential as sources of innovation?

Cross-national diffusion of innovation is taking place to a limited extent. Only 10 percent of FHWs report that they source ideas from practice in other countries. Very little reverse innovation appears to be taking place.

The literature on reverse innovation provides significant empirical evidence that many important ideas for improving healthcare arise from resource-poor contexts and could be of relevance and importance if adapted to high-income settings. To explore how much FHWs engage in reverse innovation, we asked them which three countries they regard as a useful source of ideas for improving ways of working in their own healthcare organization, and why.

Ten percent of FHWs report sourcing ideas from clinical practice in other countries. Higher proportions do so in Brazil (18 percent), Tanzania (12 percent) and, to a lesser extent, India (10 percent). Overall, FHWs in all six countries primarily cite HICs as useful sources of ideas (see Figure 10).

Figure 10: Proportion of FHWs that cite a low- or middle-income country as a source of ideas



Base: 1,356 interviews with FHWs

FHWs in some countries cite MICs as useful sources of ideas. But LICs are mentioned rarely, and only by FHWs in Tanzania.

Figure 11 shows the proportion of respondents that mention the listed country (right-hand axis) in their list of top three countries as useful sources of ideas or innovation. The country case studies in Appendix 3 show the breakdown of responses by the country studied in more detail. The US and England rank as the two most important sources of innovation across the six countries studied, with two thirds of FHWs mentioning the US and almost half mentioning England or the countries of the UK. Beyond these two countries, Canada (23 percent), Germany (20 percent), India (16 percent), France (13 percent) and Australia (12 percent) are the highest ranked. Further countries seen as useful sources of ideas include Japan (7 percent), South Africa (7 percent), Sweden (6 percent), Switzerland (4 percent), China (3 percent), Israel (3 percent), Italy (3 percent), Kenya (3 percent), the Netherlands (3 percent) and Singapore (3 percent).

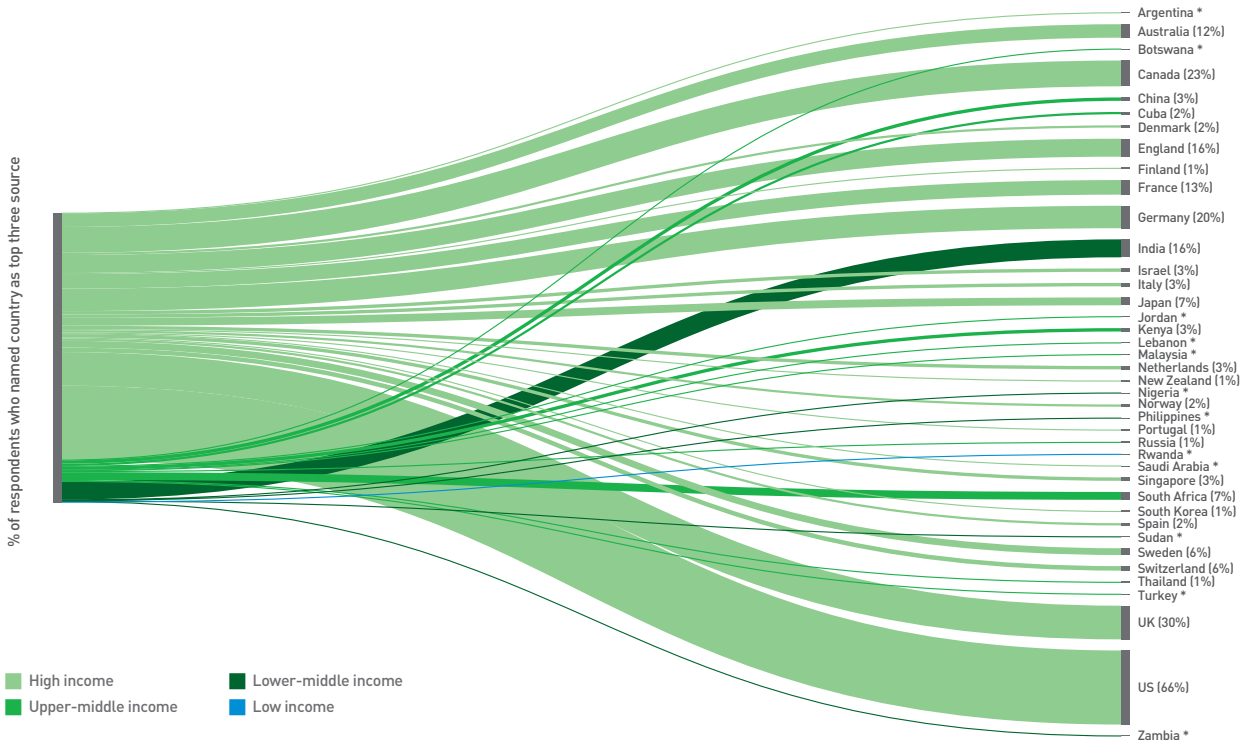
While there are several MICs on this list, India is by far the most prominent. It is most frequently mentioned by FHWs in Tanzania (58 percent), Qatar (18 percent) and India (17 percent). South Africa is seen as an important source of ideas by FHWs in Tanzania (33 percent). In general, FHWs in the two OECD countries covered by this study (US and England) do not cite LMICs as the most important sources of ideas. FHWs from LMICs covered by the study, as well as FHWs from Qatar, are more likely to report LMICs as useful sources for ideas to improve their healthcare practice (see Figure 11).

As a HIC situated in the Middle East, Qatar is an interesting case. FHWs in Qatar perceive MICs and HICs among their three most useful sources of ideas. This may relate to factors such as Qatar's small size and high expatriate population (including many from the Asian subcontinent), increasing the likelihood of looking to other countries for ideas.

FHWs in India and Tanzania also name MICs as useful sources of ideas. However, LICs are hardly mentioned by FHWs as a source of innovation in any of the six geographies studied; Rwanda (five mentions) and Uganda (four mentions) are the only LICs mentioned in the study – all by FHWs in Tanzania. FHWs in certain high-income contexts (for example, Qatar) look to LMICs as a source of innovations, but with a firm focus on sourcing from MICs rather than the most resource-poor countries.

As might be expected, geographical proximity also plays an important role in the countries that FHWs see as useful sources of innovation. FHWs in Brazil are more focused on the high-income North American countries of the US and Canada, and Cuba is also mentioned as a useful source of ideas. Similarly, FHWs in Tanzania mention middle-income African countries (South Africa, Kenya), and those in India highlight OECD countries in the Asia-Pacific region (Australia, Japan, Singapore).

Figure 11: Countries seen as sources of innovation ideas



An asterisk indicates a percentage greater than zero but lower than one percent.
Base: 1,356 interviews with FHWs

The US is the country most frequently mentioned by FHWs in all six countries studied. However, there are still significant differences in which countries FHWs perceive as being the most useful sources of ideas. In England, FHWs mention Germany, Australia, France and Sweden more often than those in the other countries do. Those in the US perceive Canada, England, Israel and Japan as useful sources more than others do. In Brazil, FHWs mention the US, England, Canada, France, Switzerland, Spain, Portugal and Cuba as sources of useful ideas more frequently than those in other countries. FHWs in Qatar mention the US, India and France, while those in Tanzania cite India, England, South Africa, Kenya, Denmark, China and Cuba. In India, FHWs consider the US, England, Australia, Japan and Singapore as useful sources of innovation.

For some FHWs, similarity of context is a key reason to select certain countries as useful sources of innovations. For others it is about a country's reputation for high-quality healthcare.

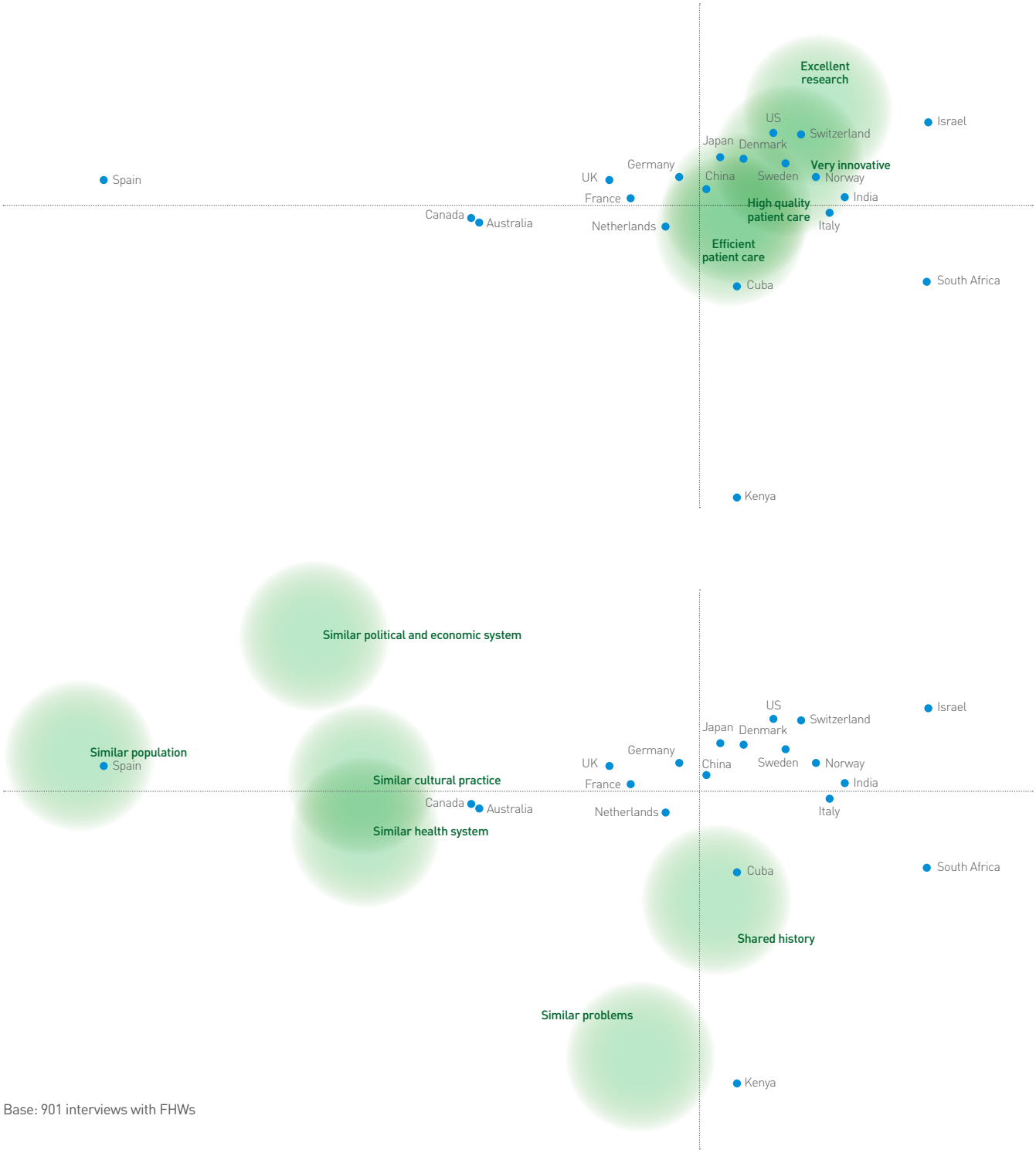
FHWs were also asked to choose from a list of 10 reasons why they identified these countries as useful sources of ideas. Reasons for selecting specific countries for ideas vary across those studied. In the US, England and India, similarity to their own country emerges as a key reason, with FHWs mentioning factors such as similar populations, cultural backgrounds, political and economic system, healthcare system and problems, as well as countries with which their own country has a shared history (for example, England by FHWs in India, Australia and the US; Canada by FHWs in

the US; Portugal and the US by FHWs in Brazil). In Brazil, Tanzania and Qatar, FHWs focus more on the perceived quality of healthcare in the countries they see as useful sources of ideas, mentioning factors such as high-quality patient care, efficiency in care delivery, innovations and excellent research.

The perception map (see Figure 12) shows the 20 most commonly identified countries as useful sources of ideas and the 10 reasons why countries are identified as useful sources of ideas. The map is divided into two, where the top map shows 'reputational' reasons of quality, efficiency, innovation and excellence. These are clustered in the top right-hand quadrant of the map. The bottom map shows 'perceived similarity' reasons clustered in the top- and bottom-left quadrants, specifically similarity of context, health system, populations, history and health problems. The perception map is based on correspondence analysis, the relative rather than absolute frequency that a reason is given for a country to be identified as a useful source of ideas. This means that any reasons for selecting a given country over others (a higher proportion of mentions for that country) are more closely associated with that country and therefore closer to that country on the map.

The countries that are selected by FHWs as useful sources of ideas because of their reputation are clustered in the top-right quadrant of the top map. Several Western European countries, but also the US, Japan, India and China, fall into this 'reputation' quadrant because excellent research, innovation and high-quality patient care are relatively more frequently mentioned as reasons for why these countries are useful sources of ideas. Canada and Australia are cited relatively more frequently for reasons of perceived similarity, of health system and cultural practices, predominantly by respondents from the US. Spain is cited relatively more frequently for reasons of perceived similarity in population. Kenya is cited relatively more frequently for reasons of perceived similarity in health problems – in this instance driven predominantly by respondents from Tanzania. Some of the countries, such as the UK, France and Germany, are in the space between the core of two clusters because they are perceived as innovative and advanced in healthcare and similar in terms of culture, socioeconomic situation and health system by respondents.

Figure 12: Perception map: why countries as seen as sources of innovation ideas*



Base: 901 interviews with FHWs

* Perception map is based on responses to the questions 'Which three countries do you regard as a useful source of ideas when it comes to the improvements that could be introduced to ways of working in your organization?' and 'What are the three most important reasons you mention each of these countries?' The distribution of the plots on the map was determined by the correlation between the answers provided by the respondents. Clusters occur when the reasons stated in the answer tend to be given together. The x-axis represents domains of 'similarity' and the y-axis represents domains of 'reputation'.

There is clear alignment between healthcare leaders and FHWs about which countries are useful sources of innovation. However, it is difficult to predict what reasons are given for a particular country being viewed as a source of innovation.

In general, FHWs' and healthcare leaders' perceptions are in line when it comes to which countries they see as useful sources of innovation. In our interviews with healthcare leaders, they most often mention high-income OECD countries: the US and Canada, Western European countries such as Germany, France, England and the Netherlands, Scandinavian countries, Australia and Japan. Reasons leaders give for selecting these countries are broadly consistent across the six countries covered by the study and are generally quite closely aligned with those given by FHWs: high-quality healthcare, outstanding research, dedication to innovation, advanced technology and superior methods and treatments.

Where MICs are mentioned by leaders, those in Tanzania perceive India as very innovative, and also cite South Africa and Kenya. This contrasts with sporadic mentions by leaders in other countries who studied India as a source of good ideas, especially for cost-reduction and low-investment improvements. In Brazil, Cuba is also mentioned as a good example of a public healthcare system, as are some African countries. For example, the way in which Ebola was treated in some African countries inspired a way of treating the Zika epidemic in Brazil.

Leaders point out that there is no single country that is an outstanding example of excellence in all areas. Instead, they see different countries as valuable sources of ideas depending on particular areas of excellence or innovation to deal with given healthcare issues. For example, the US is seen as leading the way in technology, Spain as a strong example of innovation in integrated care, and Japan as very advanced in surgical procedures.

Leaders in **England** mention the US, France, Germany, Netherlands, Spain, Scandinavian countries and Australia most often as useful sources. The US is leading in developing new technology and treatments. Although, leaders note that the different financing of healthcare in the US and England mean that translation of models from the US context can be challenging. Germany is perceived as a leader in research and new models of working, such as 'complete care' models. Spain is mentioned as a great example of integrated healthcare. As for FHWs, leaders focus on HICs, although there are mentions of middle-income India as a good example of how innovations can be introduced with minimal investment yet have a significant impact on healthcare outcomes.

"Paris – a few members of the team went there a couple of weeks ago to look at new piece of radiological/diagnostic equipment. Being proactive is about being at the front end of something new that's potentially the best thing in the field. We heard about this through one of the consultants who had heard about it. He told us, so we arranged a meeting. South Africa and Switzerland – our major shareholders – are there so we're linked into them too. The US as well because private healthcare is much more prevalent; there are good examples of improved efficiency because more than 50% of population use the independent sector."

England

In the **US**, leaders mention England and Canada as excellent, nationally integrated healthcare systems from which to draw innovations for government-sponsored healthcare, as these countries have similar cultures and patient populations to the US. Germany, Taiwan, Scandinavian countries, Japan and China are also cited as countries at the forefront of technology and data management. Germany is also cited as leading in drug development and treatment therapies. Leaders in the US view drug regulation in their country as a significant barrier to experimental drug trials and the ability to be as innovative as Germany. Scandinavian countries and Taiwan are good examples of systems with comprehensive electronic health records. Large-scale national databases in European countries (particularly Scandinavia, France and England) are cited as great sources of data for looking at the effect of healthcare innovations. England and Australia are mentioned by leaders in the US as good examples of treating mental health, with early intervention and education cited as the innovations to look to.

In **Qatar,** the US and Northern and Western European countries are mentioned most often by healthcare leaders. This is due to modern technologies, new medical concepts and practices and developed research programs. There are no particular mentions among Qatar's healthcare leaders of LICs or MICs, in sharp contrast to FHWs in Qatar who very often refer to India as a useful source of knowledge. It is also important to say that some of the leaders insist that Qatar [Qatari] society is very specific, which means that they do not find looking at other countries as useful. They also mention the challenge of introducing new treatments and procedures given the regulatory context.

"Sweden and the US alongside most European countries are most useful due to new concepts such as day surgeries for geriatric patients, and due to generally better and more advanced education and research."

Qatar

For leaders in **Brazil**, the US and England are the major reference points for innovation in healthcare. These countries stand out for their pioneering reputations for innovation. The US is perceived as a valuable source of innovation. This is due to the high financial investments it has made in healthcare, which have enabled it to be at the leading edge of technology and research. Also for its business-oriented system, focused on results and monitoring. Like the US, European countries are seen to be at the forefront of technology and innovation, but are also perceived as having a healthcare system with a more 'social' character, and therefore closer to the Brazilian context in its ethos of providing healthcare to all. European countries are also seen as different to the US – with its focus on economy – when it comes to healthcare costs. The US is seen to have an emphasis on saving and being less wasteful, with patients only using the system when they really need it.

> *"When I think about public health, medicine for a healthy society, I think about the European systems."*
> Brazil

> *"Americans are very technical ... [asking] 'what's the percentage?'... 'How many less people were hospitalized because of the faster emergency service you're offering?"*
> Brazil

While England is seen as particularly strong on advanced research, leaders in Brazilian public hospitals also mention France as a source of innovations in public healthcare, and the Netherlands for its expertise in old-age conditions.

Healthcare leaders in **India** most often refer to England and the US. The US featured in almost all conversations for their research capability and advanced technologies available for healthcare. The UK followed, particularly for those who are aware of the NHS system and how it functions with structured healthcare delivery, referrals, staff training, and protocols and guidelines. Also, many leaders have colleagues and family or friends living in these countries. Closer to home, Singapore is a country that is mentioned, typically by those who have visited and seen the health system to appreciate the infrastructure, process and training. Many Indian doctors are part of the healthcare system in Singapore, or have worked there. The business model of healthcare delivery (public-private partnership) is seen as very important. Other countries mentioned include Australia, Cambodia, Canada, Japan and South Korea.

> *"I truly hope that we can raise our hospitals to that level. Three countries that are best examples: Japan due to very advanced care but we cannot match that; Singapore because of very good public-private business model and because it is neighbor country, many Indian doctors work there, can adopt their practice, similar culture; and third may be England because they have very good training, the healthcare system is well structured, there are referral centers and tertiary care centers which take care of certain things, the Apex centers, so the protocols are well made out for what every hospital has to do."*
> India

Leaders in **Tanzania** cite India, the US, England and South Africa as the most innovative countries on training, medication, technology and good clinical practice. Other countries mentioned are Kenya, Germany, Sweden, Italy, Japan, South Korea, China and Thailand. While the US and European countries are perceived as advanced in technology, research and treatments, South Africa, Kenya and India are seen as much closer to the Tanzanian socioeconomic and cultural context and as having much more affordable treatments, technology and knowledge.

> *"India, Italy and America. I have not ordered them in any way because they are all good but it depends on what you need. For example, America is good for guidelines and advice; Italy is good for advanced technological devices; and in India devices are easily available and at affordable costs compared to America which also has advanced technology."*
> Tanzania

The role of curating innovations

The role of curators in linking innovation demand and supply could be critical, but currently does not influence FHW practice.

A range of specialist curator organizations has emerged in recent years to support sharing ideas about delivering healthcare and promoting the spread (locally and globally) of healthcare innovations. These organizations search out and collate healthcare innovations to provide information to healthcare professionals who are seeking new policies, products or practices to improve the quality of their work. Because of their focus on sourcing and spreading ideas, these organizations are more likely to be able to carry out far-reaching innovation searches compared to those on the frontline of healthcare. This means that such organizations have the potential to play a powerful role in propagating ideas and solutions that meet the needs of FHWs and healthcare leaders. They are also well placed to source alternative ideas, rather than 'business as usual' ideas. However, the success of their endeavors in transforming healthcare outcomes depends largely on how their work reaches and connects with users in healthcare organizations. Our research looks at the extent of this.

We examine how curators can play a more relevant role in diffusing innovations into future clinical practice. As well as looking at how FHWs and leaders make use of curator organizations in sourcing ideas, we investigate how curator organizations take their users' needs into account. And we look at whether the supply of information from these organizations aligns with the needs of healthcare organizations in the six countries in our study.

Curator organizations are highly diverse – in terms of organizational and delivery models, geographical focus and motivations for undertaking their activities.

'Innovation curators' is an umbrella term covering a diverse set of organizations with a broad range of structures and delivery models. For many, curating innovations is just one of many areas of activity, although, for some, this is the sole focus. They include:

- Not-for-profit organizations, such as, the US-based Center for Health Market Innovations (CHMI)
- Healthcare systems looking to improve performance through better-informed decision-making, for example, Intermountain Healthcare in the US
- Foundations such as the US-based Commonwealth Fund
- Privately and publicly funded conference and exhibition organizations, such as Qatar International Medical Congress (QIMC), NHS Health and Care Innovation Expo in England, and WISH Innovation Showcases in Qatar
- Publicly funded centers, networks and websites, for example:
  - In India, the Millennium Alliance and the Centre for Innovations in Public Systems (CIPS)
  - In England, NHS Innovation Exchange, a web portal that acts as a single point of innovation for the NHS
  - The Mental Health Innovation Network (MHIN), an online platform for global mental health innovators which is a partnership between the World Health Organization (WHO), Department of Mental Health and Substance Abuse and the Centre for Global Mental Health at the London School of Hygiene and Tropical Medicine.

Characteristics of these diverse organizations are shown in Table 3.

Table 3: Curator organization characteristics

Name	Location	User audiences	Source of innovations
Center for Health Market Innovations	US	Innovators, funders, policymakers and researchers	Crowdsourcing via virtual platform; extensive global networks of partners to identify innovations at grassroots level
Centre for Innovations in Public Systems	India	Government institutions	Crowdsourcing via virtual platform
Commonwealth Fund	US	Health policymakers, providers, academics, innovation centers and other foundations in the US and abroad	Extensive networks; commissioning literature reviews and funding studies and evaluations
Intermountain Healthcare	US	Organization's own workforce, other healthcare providers and senior healthcare leaders in the US and abroad	Internal quality improvement and measurement system
Mental Health Innovation Network	England	Practitioners, researchers and academics, some policymakers and funders	Use of networks; crowdsourcing via website
Millennium Alliance	India	Innovators	Crowdsourcing through calls for grant applications
NHS England Innovation Team	England	Public healthcare system (different programs target particular audiences)	Holding open competitions or working with partner organizations
NHS Health and Care Innovation Expo	England	Healthcare leaders and FHWs within the public healthcare system	Use of networks; attending similar events; open workshop applications
Qatar International Medical Congress	Qatar	Domestic healthcare industry	Internet research and attending similar events in Europe and elsewhere
WISH Innovation Showcases	Qatar	WISH delegates (senior healthcare decision-makers internationally), innovators	Crowdsourcing through applications to competition

	Curation as core mission or sub-mission?	Primary curation activities	Link
	Core mission	Managing a virtual platform for innovators to submit information	http://healthmarketinnovations.org
	Core mission	Publication on website and dissemination via training institutes	www.cips.org.in
	Core mission	Collecting and sharing information through research, publications, data tools, press releases, briefing meetings, social media, and so on	www.commonwealthfund.org
	Sub-mission	Knowledge management system; training program; published research	https://intermountainhealthcare.org/research
	Core mission	Creating an online network to share learning, support knowledge take-up and encourage partnership working	http://mhinnovation.net
	Core mission (but not limited to healthcare)	Identifying innovations, providing innovators with grants and support services to test and scale-up successful innovation	www.millenniumalliance.in
	Core mission	Various programs of activity e.g. competitions to identify and raise the profile of new innovations	www.england.nhs.uk/ourwork/innovation/innovation-activity/
	Core mission	Annual conference to spread innovation	www.england.nhs.uk/expo/
	Core mission	Annual exhibition of innovation from international companies	www.q-imc.com
	Core mission	Competition to select innovations to showcase at WISH summit	wish-qatar.org/summit/2015-summit/innovation-showcases-2015/innovation-showcases-2015

Curator organizations use various methods to disseminate information about innovations. Those organizations that are embedded in health systems are more aligned to FHW needs.

The curators we researched differ in their primary activities. There are those that take a more passive approach to spreading their innovation information, using websites and online platforms as the principal means of spreading innovations (Commonwealth Fund, MHIN). Others take a more proactive approach, using grant-making, conferences, exhibitions and awards to stimulate take-up and diffusion of their curated innovations (Millennium Alliance, QIMC, WISH Innovation Showcases, and NHS Health and Care Innovation Expo). Some organizations, such as CHMI, have a dual approach, incorporating online platforms and proactive engagement of innovators promoting collaboration. These collaborations between curator organizations, innovators and government provide learning exchanges to spread new and emerging innovations. CIPS in India is unusual in its strong focus on dissemination to its users; the organization compiles best practice into a compendium that is available on its website. It also carries out extensive training to disseminate these innovations to policymakers through 15 administrative training institutes (ATIs) in different states of India. Some organizations, such as the Commonwealth Fund, are also actively working to promote the conditions that generally encourage innovation.

Curator organizations that are 'embedded' within a particular health system are more likely to be aligned with clinical needs, but are also more likely to look within their own health system or country for innovations, rather than sourcing them more widely. While most of the curators we spoke with have innovation curation as their primary activity, there are two for whom this is just one part of their mission. Intermountain, for example, is focused on its core mission of healthcare delivery in Utah and Idaho, but also undertakes multiple activities that could be described as innovation curation through its Advanced Training Program and network of alumni. This network actively shares quality improvement methodologies and maintains online knowledge resources.

Curator organizations source innovations for different stakeholders and from different locations. Some curators cast a global net to find innovations from around the world.

Curators' geographical focus also differs across organizations – in terms of their user audiences and the innovations they source. NHS Health and Care Innovation Expo in England, for example, focuses primarily on a domestic user audience and local sources of innovation, although with some international presence. QIMC is about 'bringing the world to Qatar'; while the exhibition's primary user audience is domestic, innovations are sourced globally. Others have a global development focus: MHIN seeks to promote evidence-based care in LMICs; and CHMI is focused internationally on LMICs, although it has also done small-scale work on 'reverse innovations', looking at how models developed in LMICs can be adapted to improve the healthcare system in the US. Others, such as WISH, are global in their primary user audiences and the innovations they source, although in practice sourcing strategies can mean that more innovations are sourced from HICs than from MICs or LICs.

Intermountain's primary users are domestic and global, although the main source for its innovations is domestic, within the health system it operates in.

These organizations also have diverse reasons for engaging in innovation curation. A key motivation for some is improving the performance of domestic healthcare systems by increasing quality and reducing costs. For example, QIMC seeks to bring innovations developed in Europe, Asia and the US to market in Qatar, which produces few medical products domestically. CIPS in India has a mandate to identify, document, disseminate and replicate innovative practices across the country, covering four major areas, including healthcare. Another example is the Commonwealth Fund's mission to create a high-performing health system in the US, constantly looking to improve the system by looking internationally for ideas that could apply to the US. For others, such as CHMI in the US and MHIN in England, the primary objective is a global public good; curation activities are undertaken with the aim of improving healthcare internationally, often with a particular focus (for example, on LICs and MICs). For those that are themselves healthcare organizations, such as Intermountain in the US, or the range of NHS innovation initiatives in England, curating innovations can contribute to improving their own organization's performance by identifying, refining and disseminating best practice among staff.

Those we spoke with from the WISH Innovation Showcases and MHIN identified a secondary motivation: their curation activities contribute to a broader innovation agenda. By facilitating interaction between innovators and important healthcare players such as funders, policymakers and academics, curation supports innovators. In particular, it allows innovators with few resources to engage funders and access opportunities to develop their innovations further and take them to scale.

> *"One of the strong points is it gives people [who are] maybe in not a very strong position, maybe not with even a big company or financial backing behind them, to engage with policymakers but also people who could support them financially, or at least open up other networks to them. But I'd also like to think the other idea is that, even with innovations that are in one specific area, it may cross-fertilize decision-makers or people interested in innovation to think about things in a different way and maybe seed other ideas in different corners of healthcare."*
>
> WISH Innovation Showcases, Qatar

This diversity is reflected in the wide range of approaches curators take to sourcing innovations. Curators are able to mine wide networks for the latest innovations, or those that are 'off the radar'.

The diverse routes taken by different organizations underlines another key finding: the importance of professional networks and partner organizations in sourcing innovation. Curators describe using platforms and networks to access new ideas; for example, NHS England Innovation Unit uses partners such as the National Institute for Health and Care Excellence (NICE) to help them identify potentially suitable innovations. MHIN initially drew on the knowledge of its founder researchers to populate its innovation database. Innovative projects identified were approached for further information and contacts. Intermountain's annual training program creates networks of alumni who are well placed to identify innovations of interest. CHMI makes

use of regional or country partner organizations to source innovations, as well as drawing on knowledge from other partners that manage databases.

Other ways to source innovations include:

- **Calls for innovations** – Organizations identify new innovations by using (typically open) calls, competitions and invitations to innovators to showcase their projects at exhibitions. MHIN and CHMI have set up virtual platforms for innovators to provide data on their work. In other cases, applicants are offered some incentive to participate, such as support to develop or commercialize their ideas. The Millennium Alliance in India, for example, holds a 'grand challenge' to identify breakthrough innovations from entrepreneurs, publicized through roadshows, advertising, clusters and local, state and national media. Winners are given support services and finances to pilot a concept or take it to scale.
- **Targeted research and event attendance** – A number of organizations (such as the NHS Innovation Exchange in England and the Millennium Alliance in India) say that they first identify a set of strategic priority areas (often challenges or problems). They then conduct primary research to identify potential innovations to address these challenges. For example, the Millennium Alliance focuses on two areas within the healthcare sector that have been identified as areas of need: maternal and child health; and reproductive and family planning. Others mention online searches and attending relevant exhibitions and events where they are able to make contact with innovators and entrepreneurs.
- **Reviewing internally generated knowledge and data** – Intermountain Healthcare report using an internal quality improvement system to create best practice guidelines for specific conditions, informed by internal measurement of clinical outcomes and costs. Intermountain clinicians meet monthly to review the best practice guidelines against patient outcomes from their own data and newly published scientific literature. They use this to share knowledge about how to improve performance, particularly in their own facilities.

Many curated innovations are in early stages and traditional methods of validation may not apply. Curator organizations do not, in general, have an explicit methodology to determine the validity of the curated innovations.

There are curators who make significant efforts to test or validate the innovations they promote.

> *We select certain projects for which we do on-site due diligence. The process is very robust … an expert committee goes there and they submit their report and then we give a fair chance to innovators to respond. He comes, speaks to the jury, based on their intelligence and [the] session, we finally select the award. So it is a [time-consuming], lengthy process, but it is very thorough.*
>
> Millennium Alliance, India

However, most of the curators we spoke with do little or no testing. They rarely validate the innovations they source. This tends to be due to resource constraints. Some stress that their focus is on ideas that have already been validated, and they target other barriers to adoption. Others who do not validate take the approach of clearly identifying self-reported data and encouraging peer review. Curators also point out that many early-stage innovations will not yet have external validation but could still be a valuable addition to their databases. This is because they are likely to be tested more rigorously, with planned future evaluation. One curator describes how these are discussed by their team; they judge the merits of including early-stage innovations depending on the potential benefit to patients. Another makes the point that validating all information would potentially undermine the open-platform nature of the curation database. However, they also encourage users to submit externally validated results and provide a specific area for this on their website.

Curators are making efforts to engage users – although there is more emphasis on informing innovators and policymakers rather than managers and FHWs.

In the main, curators do not mention FHWs as key users of the information they provide. There are exceptions, however, with some services, exhibitions and conferences focused on clinical staff. The users identified vary between curator organizations – as does curators' knowledge of who their users are. They include healthcare leaders, policymakers, funders, researchers and academics. Innovators themselves are also mentioned as important audiences by some.

Curators that use their website as the key tool to spread innovations, such as CHMI, the Commonwealth Fund and MHIN, are typically seeking to broadcast information to a broad and diverse community of users. For this group, user engagement tends to be driven by a more one-way approach, supporting users by offering resources and providing access to evidence through social media, websites, newsletters, and ad-hoc publications.

Impact is not always assessed – although there are curators who make significant attempts to gauge the impact of their activities on users.

The extent to which curator organizations measure their impact varies widely, and there are those who do not have any measures of success. Most track user engagement and use of their resources, review attendance by exhibitors and visitors at events, and analyze website visits or data downloads. Fewer organizations monitor other metrics relating to the impact of the information disseminated, such as how it has helped to change behavior, and which of the curated innovations have diffused to other contexts.

CHMI tracks the partnerships it has instigated on an annual basis. This is to understand what partners have done differently as a result of their involvement. CHMI also commissioned an external evaluation in 2015, reporting its results and areas for improvement. The Commonwealth Fund monitors regulations, policy and legislation, and the practice of the health organizations it targets, to see if these reflect or cite its work. As well as citations, the organization also monitors mentions of its work on social media, particularly by policymakers. The Commonwealth Fund surveys

relevant audiences, such as leaders of health delivery systems, to understand awareness of its work and its influence in general, but not the impact of their specific activity to scale innovations.

None of the curator organizations are able to ascertain whether they are effective at improving the diffusion and take-up of the innovations they have sourced.

FHWs and healthcare leaders have little awareness of curator organizations.

The majority of FHWs do not report using curator organizations as a source of ideas. Only eight percent of those who report they had an idea for improving clinical practice in the last year say they got the idea from innovation hubs or databases. Healthcare leaders report making use of a wide range of sources, although, few mention curator organizations specifically. When asked whether they are aware of any specialist organizations that support the sharing of ideas about how to deliver healthcare, not all are aware or able to name such organizations. When leaders do name organizations, it is not the same innovation hubs and databases considered to be 'curators'; rather, they include a wide variety of organizations that do some sharing of innovations in healthcare but that do not have a curating function.

Some curators are closer to frontline needs than others. To have an impact all curators must become pivotal to the flow of ideas in healthcare.

Curators can help healthcare organizations engage with ideas beyond their own practice because they can source innovations from a global supply, including from LICs. For curators that are not embedded within health systems, relevance to frontline need will always be a challenge. This is because such curators are typically distanced from understanding frontline needs, since their primary users are healthcare leaders, policymakers and funders, rather than FHWs. If their understanding of frontline needs is not accurate, not clinically focused, or not aligned, this can result in a gap between the supply of ideas from curators and FHWs' needs.

> *"If you want to get real change happening on the ground, you have to be able to go that extra step with knowledge management and knowledge translation and actually get face-to-face with people and create those opportunities for innovators in order to see actual change … I hope that the sort of research and excitement around knowledge management and translating innovations into practice doesn't just result in a bunch of websites and a bunch of technical resources but actually results in people supporting the work on the ground."*
>
> Mental Health Innovation Network, England

SECTION 4: DISCUSSION AND RECOMMENDATIONS

This study set out to investigate the demand side of innovation diffusion by asking where FHWs and leaders get their ideas to improve their healthcare systems. We were able to gain insights into which countries, which media, which organizations and which sectors are influential in the experiences of those charged with delivering and leading change in healthcare.

How and where ideas are found

The sources of ideas and innovations for FHWs depended highly on the needs for better healthcare delivery and improved quality of the patient experience. We found some evidence for grassroots innovation. The vast majority of FHWs identified a need to change their way of working, and that a large proportion have even considered solutions to improve the way they work in their healthcare services. When they work in organizations that have a strategy for changing working practices, FHWs tend to report identifying solutions. However, this varied significantly across healthcare systems and the size of organization. We found that FHWs are not as involved in delivering their ideas as they could be. This is partly because they consider senior managers to be responsible for implementation. Managers recognize how important it is for FHWs to identify problems, and increasingly are recognizing the importance of them identifying solutions too.

Source of ideas

We found mixed evidence for open innovation. Most FHWs source their ideas to improve their clinical practice very close to home – with professional colleagues and patients the most frequent sources, and industry and curator organizations featuring much less. We found little evidence of far-reaching or inter-disciplinary influence, and even less from industries outside of healthcare. The FHWs' own clinical specialty dominates as a source of ideas. FHWs are much less likely to be influenced by disciplines outside their own experience. FHWs are predominantly sourcing ideas from practice within their own organizations and own clinical specialties. Cross-national diffusion of innovation is taking place to a limited extent, with only one in 10 FHWs reporting they sourced ideas from practice in other countries.

The influence of high-income countries

We found very little evidence for reverse innovation. FHWs, irrespective of which country they are from, seem to be most influenced by HICs. In some countries, FHWs cite MICs as useful sources of ideas, however, LICs are mentioned only rarely. Only FHWs in Tanzania noted the value of other LICs in providing ideas for healthcare solutions.

Similar and quality healthcare systems

For some, a similar healthcare context is a reason to identify certain countries as useful sources of innovations. For others it is about a country's reputation for high-quality healthcare. There is clear alignment between healthcare leaders and FHWs on which countries are useful sources of innovations, but it is difficult to predict the reasons why a particular country is viewed as a source of innovation.

Role of curators

The role of curators in linking innovation demand and supply could be critical, but currently does not influence FHW practice. Curators use different methods to disseminate their curated innovations and some cast a global net to find innovations from around the world, including from LICs. Curators take a wide range of approaches to sourcing innovations. Curator organizations do not, in general, have an explicit methodology to determine the validity of the curated innovations and they emphasize informing leaders, policymakers, funders, researchers, academics and innovators rather than FHWs. Because impact is rarely assessed, it is not known how effective curators are at diffusing innovations. However, we found that FHWs and healthcare leaders have little awareness of curator organizations.

Making the connections

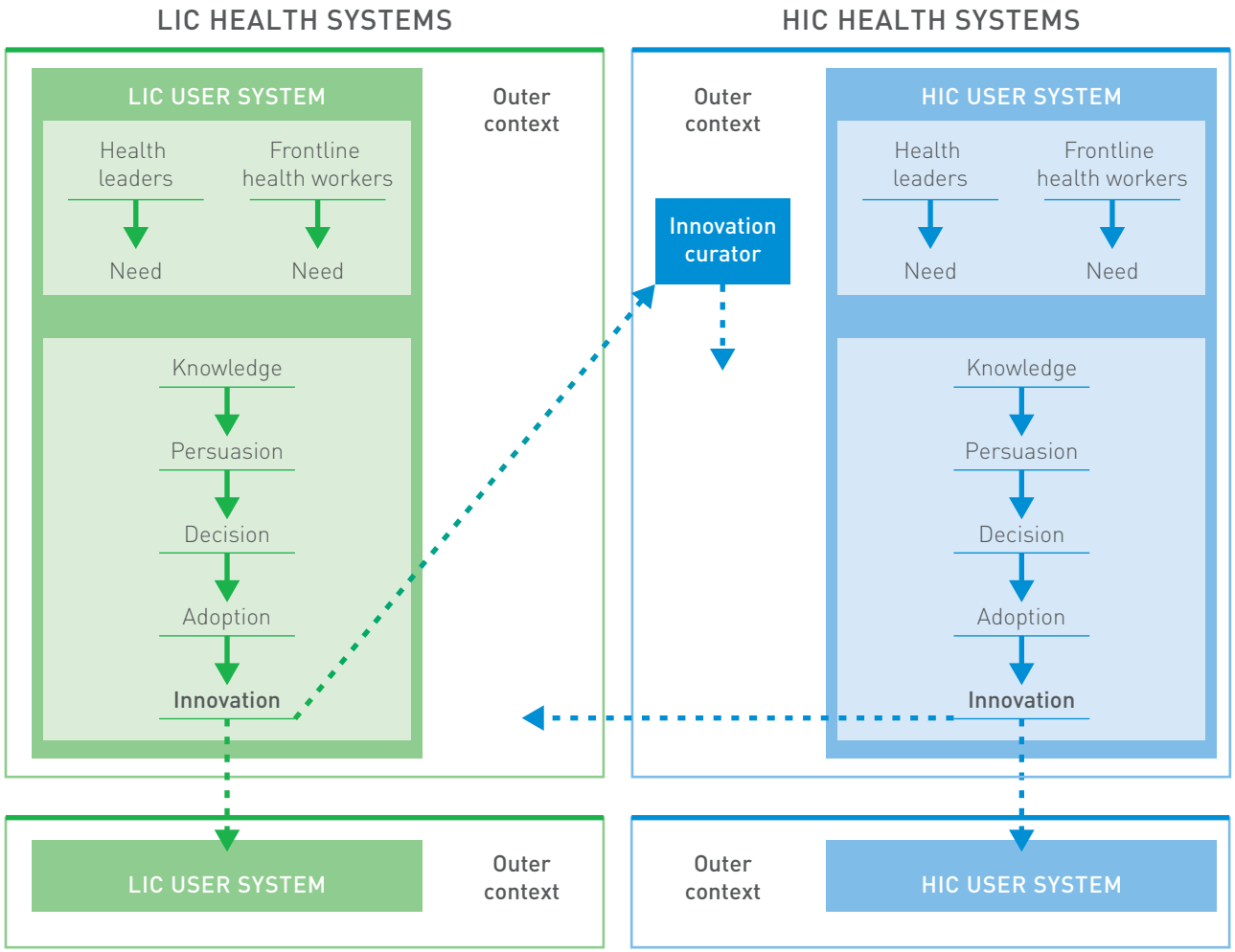
This study raises several important issues that inform the innovation diffusion agenda. These are represented in Figure 13. The first thing to note is that FHWs and leaders are not looking far afield, and are not being influenced by sources beyond their own intellectual and physical locale. This makes it unlikely that they will make connections between the diverse perspectives of different disciplines. This is necessary for the truly breakthrough opportunities in healthcare to emerge. Examples where this has taken place show the power that linking disciplines or industry sectors has to create disruptive innovations.

The remarkable success of the Aravind Eye Hospital in India demonstrates that applying the principles of mass car manufacture to ophthalmic surgery can produce cost-effective clinical solutions beyond most developed healthcare systems.[34] Formula One technology has been applied to intensive care services in Birmingham Children's Hospital to improve telemetric patient monitoring.[35] Also the WHO surgical safety checklist that has helped to prevent countless 'Never Events' (serious,

preventable incidents) in pre- and post-operative care was developed after close examination of the airline industry and the exhaustive cockpit checks that are required before, during and after air travel.[36]

This research shows that, in the countries studied, opportunities to develop the next great healthcare innovation may be missed. Previous research using social network analysis shows that clinicians are very closely connected to each other.[37] Their networks of relationships can have an impact on the spread, or suppression, of innovations.[38] Staying close to the groups they share characteristics with can thwart the spread of new ideas.[39] Effective, multidisciplinary solutions are required, and organizations should encourage interaction between different groups.[40] The FHWs and leaders that we studied seem to be focusing their attention predominantly within their own sectors. Therefore, they may not be equipping themselves adequately with the resources to creatively manage the challenges they face.

Figure 13: The gap between low- and high-income country's health systems



We found issues with the countries people are looking to for innovation ideas. First, there was a highly predictable selection of countries chosen by our respondents as the most useful sources of innovation. Almost all of the countries were high-income OECD countries, and virtually none were LICs or MICs. And yet we know that LMICs are pioneering low-cost, clinically effective solutions to meet their needs. So, this is not filtering through to healthcare workers in most of the countries we studied. To benefit from some of these exciting developments, healthcare workers need to recognize that, as well as the 'usual suspects' of the US, England and other OECD countries, low-income countries can also be a valid source of innovation.

Second, the reasons vary greatly for selecting some countries rather than others as shown in the perception map in Figure 12. Some countries are cited as useful sources because of their reputation for high-quality care and innovation. However, this does not take FHWs' specific needs into account and has little bearing on the appropriateness of their delivery models for other contexts. For example, although the US is highly regarded for patient care quality, it is unlikely that all US models of care are suitable for Tanzania or England. This is because there are major differences in the political and economic contexts, the funding, health system structure and delivery. Equally, in some countries, the sources of innovation considered useful were due to them being from places perceived to have very similar culture or health system. Respondents from the US, for example, noted that Canada and Australia are useful sources for innovation, given their 'very similar health systems'. even though their systems are in fact very different.

At the granular level, where adopting an innovation matters, all countries' health systems are completely different. A perceived similarity can drive the view that one source is more relevant than another. This is a mental shortcut, probably often used, but not always accurate. We know from the marketing literature that it matters to consumers where a product comes from.[41, 42] Recent research has shown that the source of healthcare research might influence how healthcare professionals view it.[43] While the country of origin can indicate reliability, effectiveness or quality, this can be inaccurate and result in inappropriate perceptions of innovations. There is scope for research to examine how healthcare workers perceive innovation contexts. This is a current gap in the literature.[44]

Another reason for looking to LICs is because they tend to produce cost-effective innovations.[45] Also, given their scarce resources, LICs are developing innovations that address system-wide clinical care and managerial needs at the same time. Many high-income health systems would do well to think in the same way. Efforts must be made at organizational level to create an effective strategy by aligning the needs of FHWs and health leaders. FHWs must understand that new innovations for care delivery must be introduced within the context of resource constraints. Healthcare leaders need to clearly integrate their FHWs' clinical needs into their vision and strategy for organizational change.

Finally, the study found that the role of curator organizations needs to be addressed in innovation diffusion. Curator organizations provide an exciting opportunity to support healthcare systems – in any country – to be exposed to the most exciting innovations from around the world. However, our findings show that some curators are

performing more of a library function – with, at best, an online tool that allows the user to filter by sector or geography. Curators need to understand health system needs better. They cannot just be repositories and hope that innovations diffuse passively into practice. Instead, they need to tailor their offerings to those looking for appropriate innovations. An 'innovation steward' – someone or some agency to provide a bespoke service and connect the healthcare system with effective, global healthcare innovations, including from LICs – would greatly help FHWs and leaders look beyond 'the usual suspects'. Independent innovation stewards would be able to evaluate innovations based on merit and suitability.

Curating needs to become pivotal to the flow of ideas in healthcare, to ensure bespoke matching of healthcare needs with the global supply of innovations. Examples of innovation stewards are detailed in Box 4.

Box 4: The potential of innovation stewards: Innovations in Healthcare and BasicNeeds

Innovations in Healthcare, based at Duke Global Health Institute, actively seeks and promotes healthcare innovations from around the world, including LICs. The group has an expanding network of more than 60 innovator organizations that provide access to affordable, quality healthcare in their local context. Innovations in Healthcare gives their network access to opportunities, information and contacts to help scale-up innovations. It also tries to develop practical strategies to accelerate adoption of innovations.

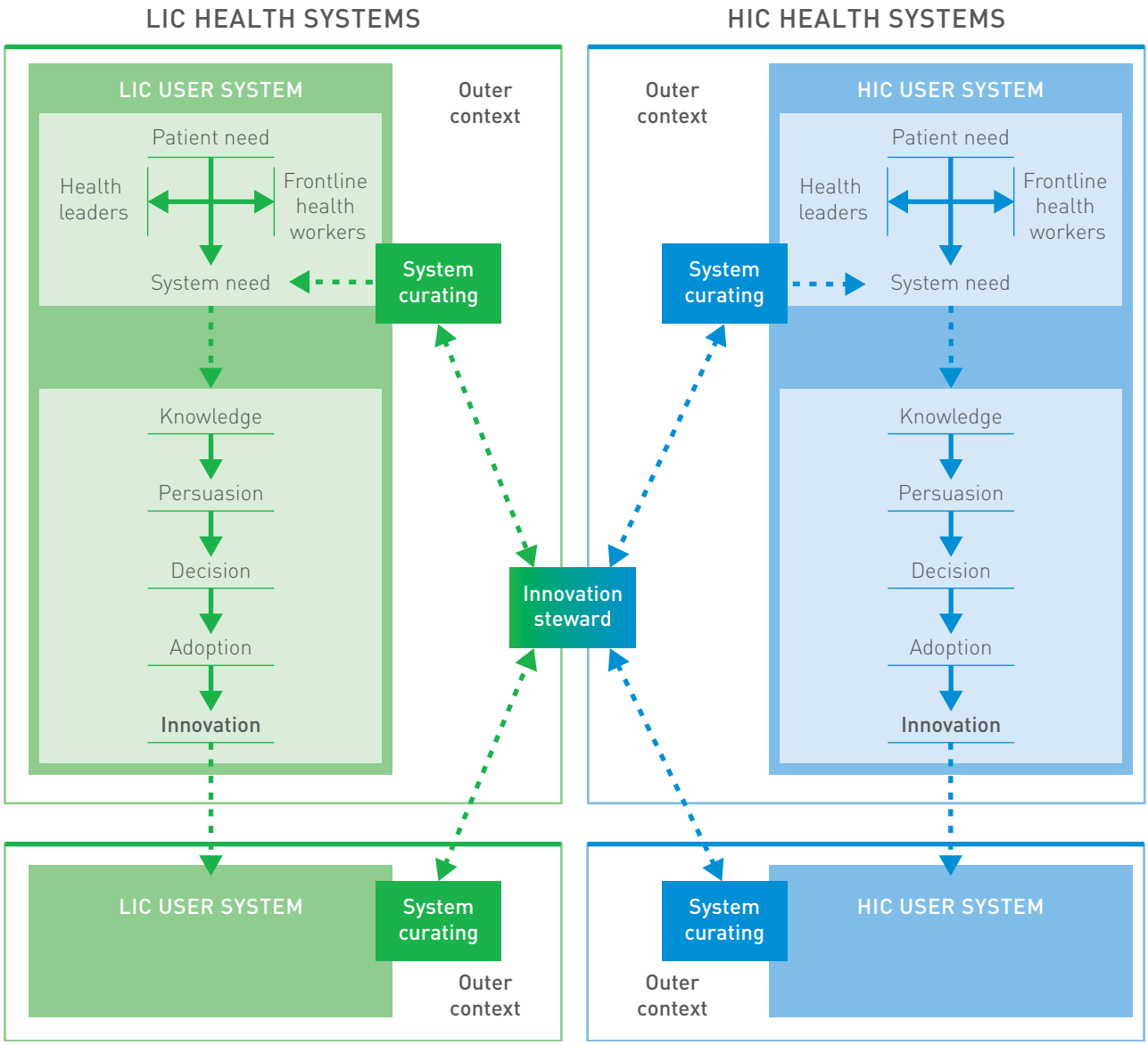
BasicNeeds is an international non-governmental organization that works to improve the lives of people living with mental illness and epilepsy. By working in partnership with people living with mental illness, BasicNeeds has built a unique and effective model for recovery and sustained good mental health. The model seeks to: build capacity – equipping people to work on mental health issues; be community focused – developing accessible services; support livelihoods – creating opportunities for affected people; research – generating and applying real-world research; and collaborate – forging partnerships to improve mental health provision.

In partnership with Innovations in Healthcare, BasicNeeds is completing a 15-month feasibility and implementation planning study funded by the Charities Aid Foundation of America. Over the next three to five years, BasicNeeds will work with Southwest Solutions, a mental health provider in Detroit, to pilot the BasicNeeds model and adapt it to the wider US community.

This collaboration demonstrates that implementing innovations from LMICs is more complex and involved than simply identifying and promoting innovations at conferences. Innovations in Healthcare has provided the credibility and contacts to achieve funding and identify a suitable site for adoption. It has developed a business plan for implementing the model in the US, and continues to support and champion the work of BasicNeeds.

The digram in Figure 14 shows how making better connections between the health systems in low- and high-income countries could improve the search for and adoption of effective innovation. FHWs and healthcare leaders should strive to make the connection within their own systems, aligning clinical, managerial and organizational needs. This alignment should be driving the search for healthcare innovations. Innovation curators should strive to better understand the system needs of healthcare organizations. They should collate and classify innovations from around the world into areas more immediately relevant to specific needs and contexts. Healthcare leaders and FHWs should network with curator organizations to tap into the supply of innovations that surpass their usual clinical and managerial practice.

Figure 14: Making better connections between low- and high-income country's health systems



Recommendations

While it is difficult to provide recommendations that suit all the countries in this study, there are broad trends and common issues around innovation diffusion. These include:

- The needs of FHWs and healthcare leaders must be understood on both sides. Efforts must be made at organizational level to align these needs to create an effective, system-wide strategy. New innovations for care delivery must be introduced within the context of resource and organizational constraints.
- Health workers and leaders should welcome unusual sources of innovation. Patients can offer timely and relevant insights to improve healthcare delivery. Equally, sectors unrelated to healthcare, such as retail or aviation, can provide comparable lessons for improved management of healthcare supply and patient safety.
- Seemingly disconnected contexts, mainly those of LMICs, can offer high-income countries simple and cost-effective, but potentially disruptive, healthcare delivery models and technologies for better health outcomes.
- Effort must be made to engage junior staff in the innovation process. They often have very good ideas but are least likely to bring these forward or to implement them. FHWs working in management positions are more likely to have an innovative idea and be able to align clinical and managerial needs.
- Curator organizations could be pivotal to the flow of ideas in healthcare. They can ensure a bespoke match between healthcare needs and the global supply of innovations, including from LICs. By acting as 'stewards' of innovations, curators can help healthcare organizations to engage with ideas from far beyond their own area of practice.

Recommendations related to specific members of the healthcare community

- Health leaders, senior managers and executives should:
  - develop and communicate a strategy for innovation, including sourcing and adopting it across their organizations. They should embrace relevant curation as part of the strategy.
  - identify the system-wide needs in their organization that address clinical and organizational challenges. This would be supported by ensuring that junior or mid-grade doctors participate in forums with FHWs and service users to identify clinical innovations that benefit the whole organization.
  - develop international health partnerships with hospitals and other clinical services in LMICs. They should ensure that clinicians and managers are engaged in a genuine learning process with the partner organization and actively seek to pilot innovations from other countries.

- Frontline healthcare workers should:
  - provide a systematic and purposeful debriefing to managers to share and learn from innovative models of care from other countries.
  - develop effective networks with colleagues in other regions to share experiences and practice, organizing at least one workshop or conference each year to learn how specific clinical challenges are being addressed elsewhere.
  - take advantage of international health partnerships and other opportunities to work and volunteer in other countries, in particular LMICs wherever possible.
- Curator organizations should:
  - offer a more bespoke, stewardship role, acting as a concierge to identify innovations from a wide range of countries that best meets the needs of the client's health system.
  - gauge the impact of their work, not just by measuring online traffic or database size, but by actively monitoring whether innovations are spreading beyond their initial intended market.
  - where they are not embedded in health systems, deepen their engagement by working with partner organizations and networks that can act as 'multipliers' for innovations. This would allow diffusion of ideas to a wider audience and also enable frontline needs to inform research.
- Health ministers and other governmental health system leaders should:
  - invigorate overseas clinical and managerial missions, particularly to LMICs. By working with professional medical colleges and postgraduate clinical boards, and by providing specific funding schemes, overseas clinical and managerial roles should be accredited and contribute to postgraduate training.
  - apply lessons from comparative policy analysis and fund pilot schemes of innovative care models that emerge. Governments should pilot innovative care models, technologies or processes in academic health science networks to multiply their effects.
  - provide funding schemes to implement innovations from overseas, with robust evaluation of the lessons learned.

APPENDIX 1: GLOBAL DIFFUSION OF HEALTHCARE INNOVATION (GDHI) – THE STORY SO FAR

The Institute of Global Health Innovation (IGHI) 2011 study *From Innovation to Transformation* identified three levels of influence on the pace and spread of the diffusion of healthcare innovation (see Figure A1):

- *Healthcare systems characteristics* set the context for healthcare innovators to flourish or struggle. They include the economic, political, legal and regulatory environment, as well as the size and structure of health systems.
- *Enablers* of innovation can be initiated through corporate or government action. Enablers can be 'soft' and offer clearly articulated visions about the tangible impacts of innovations, or 'hard' and provide financial rewards that spur the take-up and spread of innovations across health systems.
- *Frontline behaviors* (also known as 'cultural dynamics') represent actions, beliefs and practices of policymakers, healthcare organizations and professionals that manage change and deliver healthcare at the point-of-care. The behaviors range from engagement with the public on the benefits of clinical advances to the systematic elimination of old ways of working.

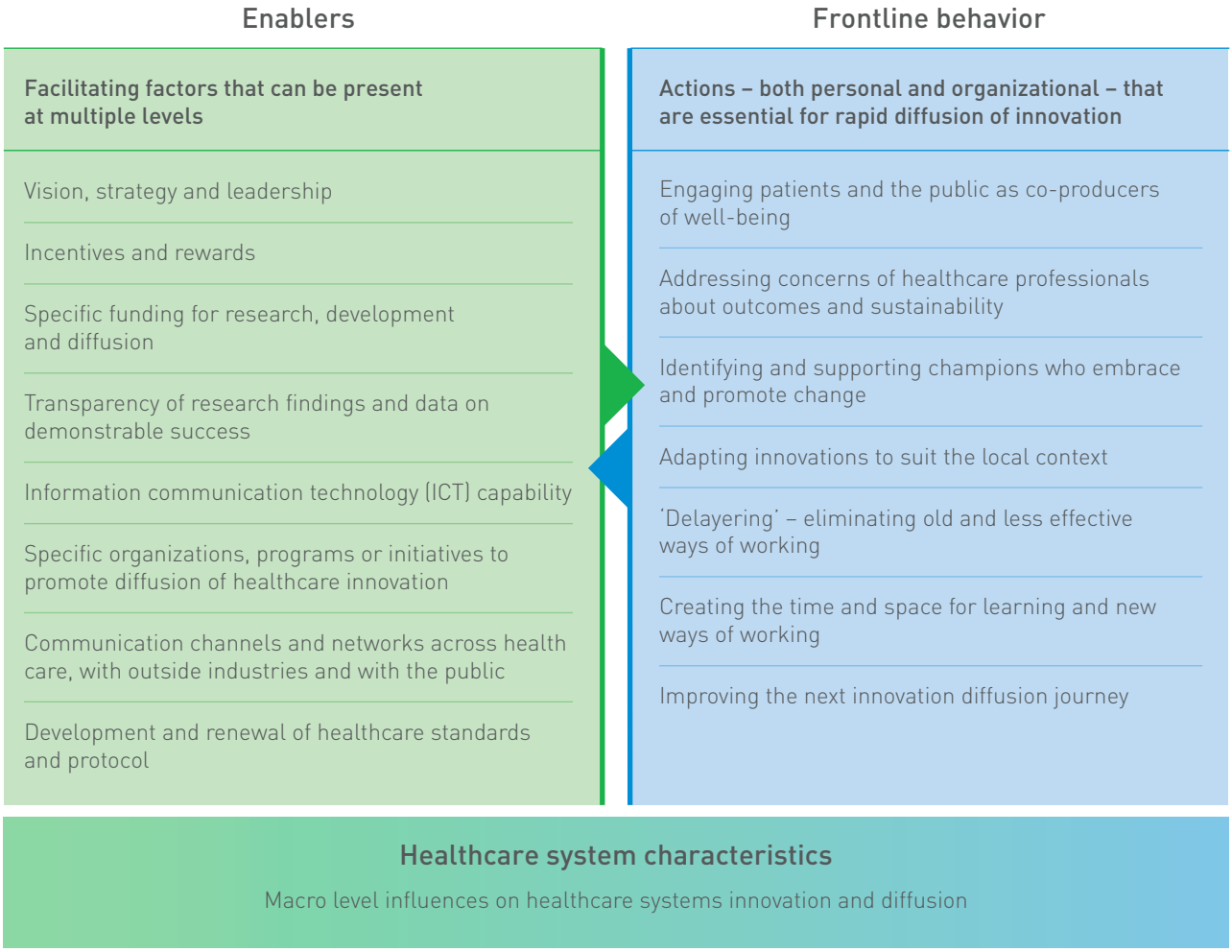
Building on this framework Ipsos MORI, with the support of IGHI, undertook the study *Global Diffusion of Healthcare Innovation* (GDHI).* The study assessed the comparative importance and prevalence of the framework's influencing factors in each of the countries studied. It used qualitative interviews with healthcare experts and an extensive quantitative survey of health professionals in eight countries (Australia, Brazil, England, India, Qatar, South Africa, Spain and the US). In the second GDHI study (2015)** we took a retrospective look at eight successful examples of relatively rapid innovation diffusion to understand better how health systems can harness the enablers, and foster the frontline behaviors that diffuse new healthcare innovations more rapidly and drive transformational system change. The study's key aims were to:

- trace the 'diffusion journey' that health systems and organizations go through, to deepen our understanding of the factors that accelerate progress.
- assess the relative importance of each of the enablers in contributing to a positive impact in relation to improved health outcomes, greater efficiency and better patient experience.
- provide guidance for policymakers and practitioners to help them create the conditions and foster behaviors that facilitate more rapid and effective system-wide change.

* World Innovation Health Summit (WISH). Global Diffusion of Healthcare Innovation 2013, www.wish-qatar.org/app/media/503

** WISH. Global Diffusion of Healthcare Innovation: accelerating the journey 2015 http://wish-qatar.org/summit/2015-summit/global-diffusion-of-healthcare-innovation

Figure A1: Framework for global diffusion of healthcare innovation



Source: WISH, Global Diffusion of Healthcare Innovation (2013)

APPENDIX 2: METHODS – STUDY DESIGN

The research program consisted of three strands:

1. Survey of frontline health workers (FHWs).
2. Qualitative in-depth interviews with healthcare leaders.
3. Qualitative in-depth interviews with curator organizations.

The study was undertaken across six countries: Brazil; England; India; Qatar; Tanzania; and the US. The research was not designed to be nationally representative because of the difficulty of generalizing about innovation at a national level and, as well as time and cost. Instead, a maximum of four large urban centers were selected for both the survey and the qualitative interviews to extract comparative insights between these elements of the study. Further details on each strand follow.

1. Quantitative survey of FHWs

Data collection

Online research with existing panels of health workers, or face-to-face interviews, was carried out across the six countries.

Table A1: Survey responses by country

Country	Method	Number of survey responses	Fieldwork dates (2016)
Brazil	Online	250	16 May to 17 June
England	Online	250	10 May to 25 May
India	Face-to-face	255	26 May to 24 June
Qatar	Face-to-face	100	23 May to 14 June
Tanzania	Face-to-face	250	23 May to 23 June
US	Online	251	10 May to 26 May
Total		**1,356**	

To ensure that the findings could be generalized within and between country contexts as far as possible, fieldwork took place in up to four cities in each country. Quotas were set for staff type (GPs, specialists, nurses and allied health professionals) to ensure that a range of FHWs with direct patient contact were targeted.

Analytical approach

The first step in the analytical approach was to apply extensive descriptive statistics and basic correlations to explore relationships between different characteristics. Multivariate techniques were used to explore the relationships between multiple variables. The research team used various types of regression analysis, such as a general linear model (for scale and ordinary variables) and logistic regression (for categorical variables). For example, we used binary logistic regression to explore the impact that different potential factors (organization characteristics and FHWs, characteristics) have on the probability to have an idea for innovation or probability to discuss the idea or solution with senior management. Correspondence analysis was used to create perception maps, while factor analysis was used to check the internal consistency of the scales and constructs they represent.

2. Qualitative in-depth interviews with healthcare leaders

In-depth qualitative interviews were conducted with 90 leaders of healthcare organizations across the six countries. Interviews were conducted in the same geographical locations as used for the quantitative survey, to ensure that leaders were likely to be drawn from systems that were similar or the same as those for FHWs participating in the survey. Between one and four interviewers carried out the interviews in each country. The number of interviews conducted in each country is provided in Table A4, along with the principal interview method used.

Table A4: Number of leader interviews conducted in each country

Country	Number of leader interviews	Method
Brazil	15	Telephone
England	15	Telephone
India	20	Face-to-face
Qatar	10	Face-to-face
Tanzania	15	Face-to-face
US	15	Telephone
Total	**90**	

Analytical approach

The qualitative data analysis used a thematic analysis approach. Data was coded and managed using an analysis framework in Excel. Key themes from the quantitative survey were explored to understand the leaders' perspective. We used sound files, transcripts and detailed field notes as our raw data, which were then transferred into our analysis framework for management purposes. Debrief calls were held with researchers who carried out the interviews in all countries. A lead researcher in each country wrote an individual country report on the qualitative findings. This helped to ensure that local context and nuance was built into the analysis. This also provided a set of reports that were then used as the basis for the qualitative analysis presented in the overall global report.

3. Qualitative in-depth interviews with curator organizations

The third stage of the project involved interviewing curator organizations. Curator organizations were identified through a desk-based literature review and online searches. Desk-based research was used in each country to offer an overview of organizations' activities, and to classify them against a set of criteria, such as whether they were publicly or privately funded. The interviews took place between 17June and 4 July 2016. Participants were recruited by local Ipsos MORI teams and interviews were carried out by trained Ipsos MORI researchers.

All interviews were transcribed, and a set of notes was prepared by the interviewer against each of the key questions in the form of an analysis spreadsheet used to structure an initial analysis note that was used to prepare the full written analysis.

Participating curator organizations are listed in Table 3 in the main report.

APPENDIX 3: COUNTRY CASE STUDIES

ENGLAND

Population
65m

GDP spend on healthcare
9.1%

Health system characteristics

Funding mechanism	Universal publicly funded access – supplemental private insurance available
Management	National policy, regional delivery
Market place	Small private-sector provision
Economy	Little competition
Service delivery	Little regional diversity
Current context	The country is preparing to leave the European Union, while the NHS is facing an increasing deficit

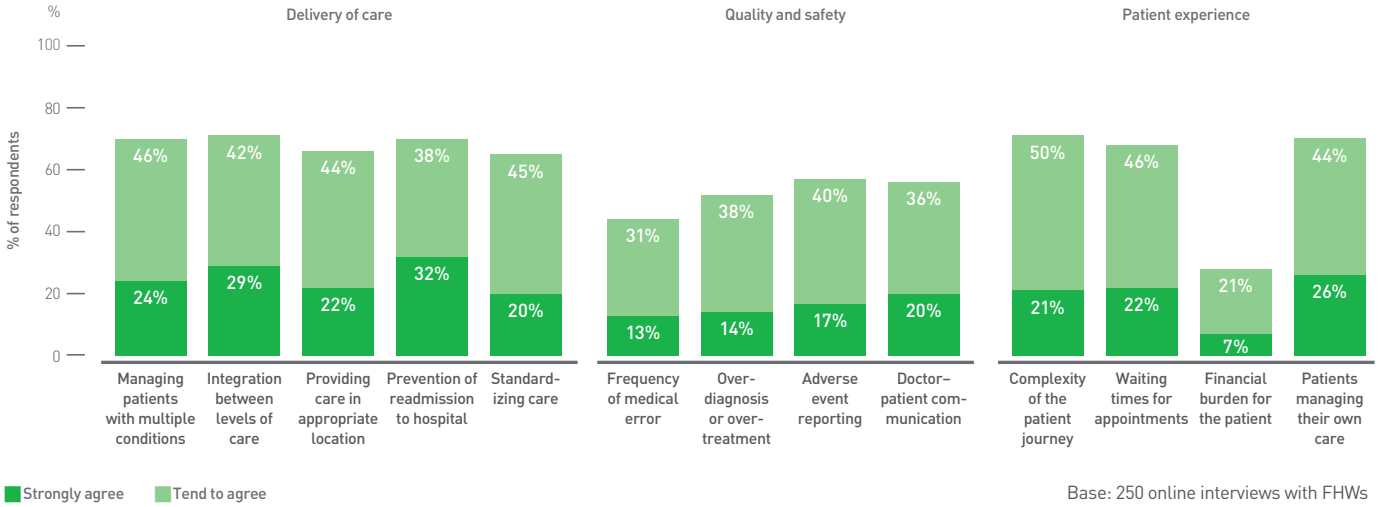
Key findings

- While concerns about quality and safety are relatively low in England, FHWs cite challenges surrounding the delivery of care and patient experience; particularly integration between levels of care and the complexity of the patient journey. Leaders also recognise these challenges, however finances are the leading concern.
- FHWs in England tend to source new ideas from other organizations in England, with only a small proportion looking to other countries.
- FHWs in England almost exclusively name other HICs as useful sources of innovation. They tend to look to these countries due to their perceived similarities.

Need for innovation

Challenges faced by frontline workers

FHWs in England see the complexity of the patient journey, and the delivery of integrated care to patients with multiple conditions as a major challenge.



Base: 250 online interviews with FHWs

Challenges faced by leaders

Leaders recognise the challenge of increasing demand due to an aging population and increasingly complex cases; however, finances are the leading concern.

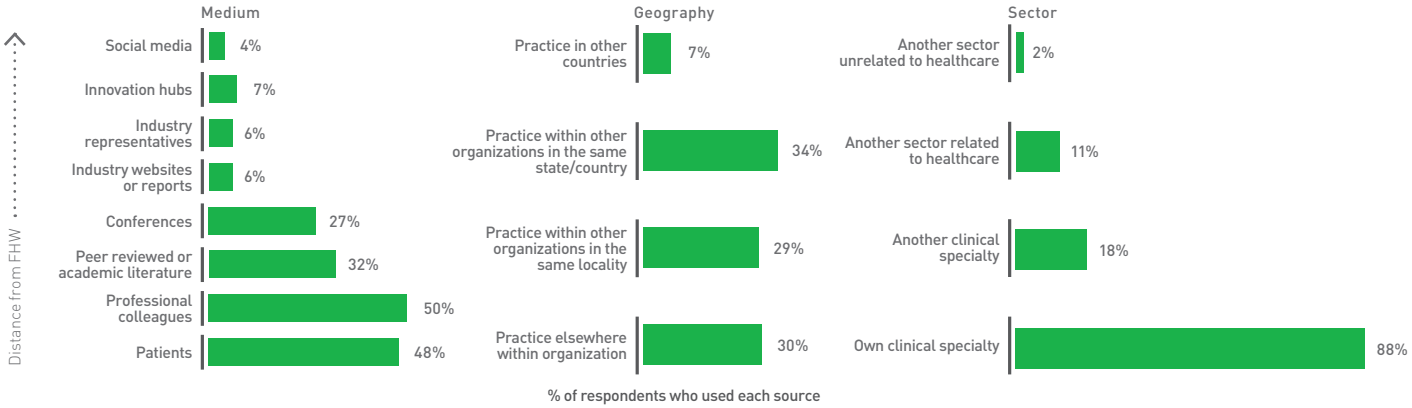
> "We are now an organization in **deficit**, which is not sustainable. We need to find a way of treating the same number of patients for less money"

> "I think the first problem is probably dealing with the **increased demand** at the front door"

> "Our primary challenge is the growth in the **elderly population** being admitted semi urgently and urgently into the hospital"

Sources of ideas

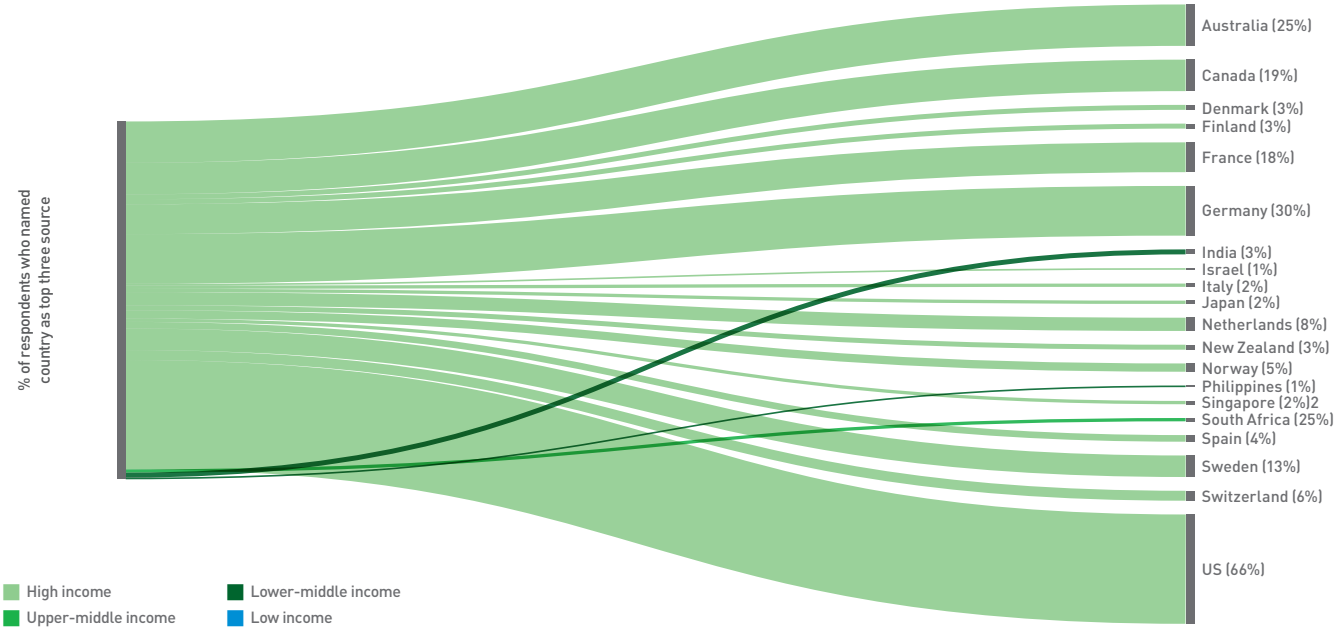
Only a small proportion of FHWs in England source ideas from other countries. Sources also tend to be restricted to healthcare, with only small proportions gaining an idea from an unrelated sector.



Base: 250 online interviews with FHWs

Countries as sources of innovation

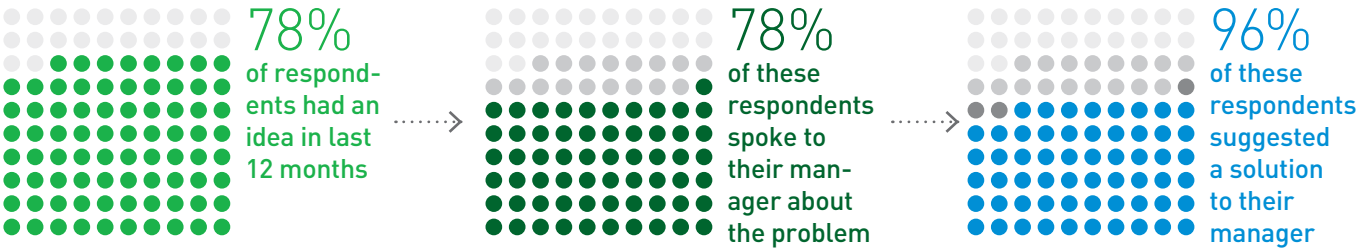
FHWs in England almost exclusively name other HICs as useful sources of innovation. They tend to look to these countries due to their perceived similarities; whether in terms of populations, health systems, health problems, cultural practices, or political and economic systems. The only MICs named (by small numbers) are India, South Africa, and the Philippines.



Base: 250 online interviews with FHWs

Process of innovation

A high proportion of FHWs have identified a situation where they wanted to make a change in the past 12 months. Although not all of these went on to speak to their manager about the problem, almost all those who did suggested a solution.



Base: 195 online interviews with FHWs

BRAZIL

Population
208m

GDP spend on healthcare
8.3%

Health system characteristics

Funding mechanism	Universal publicly funded access – supplemental private insurance available
Management	National policy, regional delivery
Market place	Medium private-sector provision
Economy	Medium competition
Service delivery	Some regional diversity
Current context	The country is in a political and economic crisis and battles epidemics of Zika, dengue and chikungunya

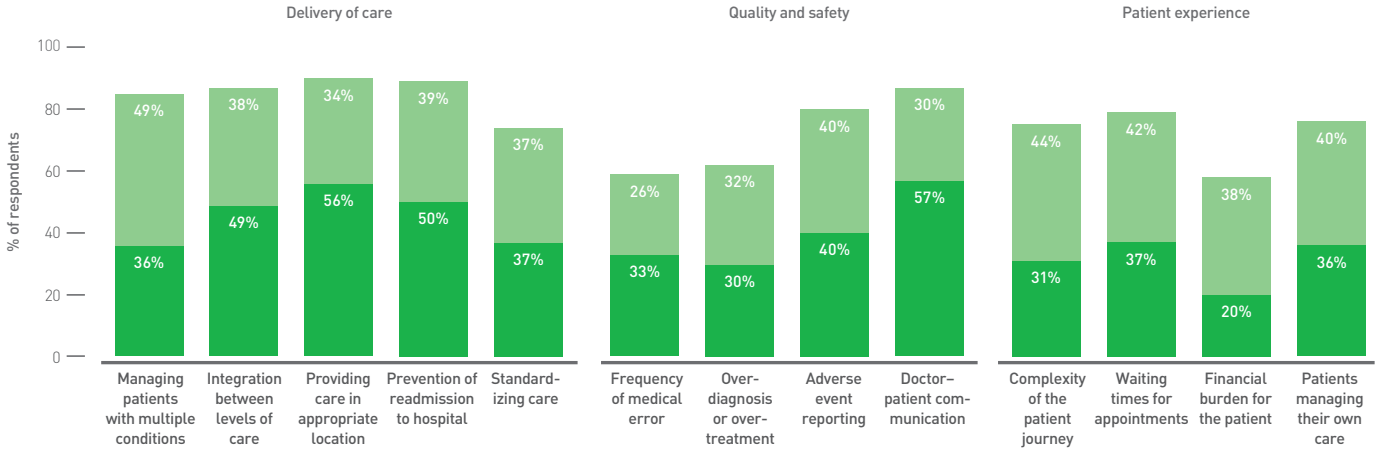
Key findings

- While FHWs in Brazil feel the greatest challenges they are facing concern the delivery of care, leaders report concerns surrounding financial challenges and a lack of human resources.
- FHWs in Brazil tend to source new ideas from practice within their own clinical specialty, local organizations, and patients and colleagues, rather than looking further afield.
- FHWs in Brazil are most likely to look to HICs as useful sources of innovation. They tend to look to these countries for reasons related to perceived high standards.

Need for innovation

Challenges faced by frontline workers

A number of challenges are mentioned by large proportions of FHWs in Brazil. Providing care in the appropriate location, integration between levels of care, and prevention of readmission to hospital are most widely seen as challenges.



Base: 250 online interviews with FHWs

Challenges faced by leaders

Leaders in Brazil's increasingly stretched public hospitals cite shortages of financial and human resources as particular concerns.

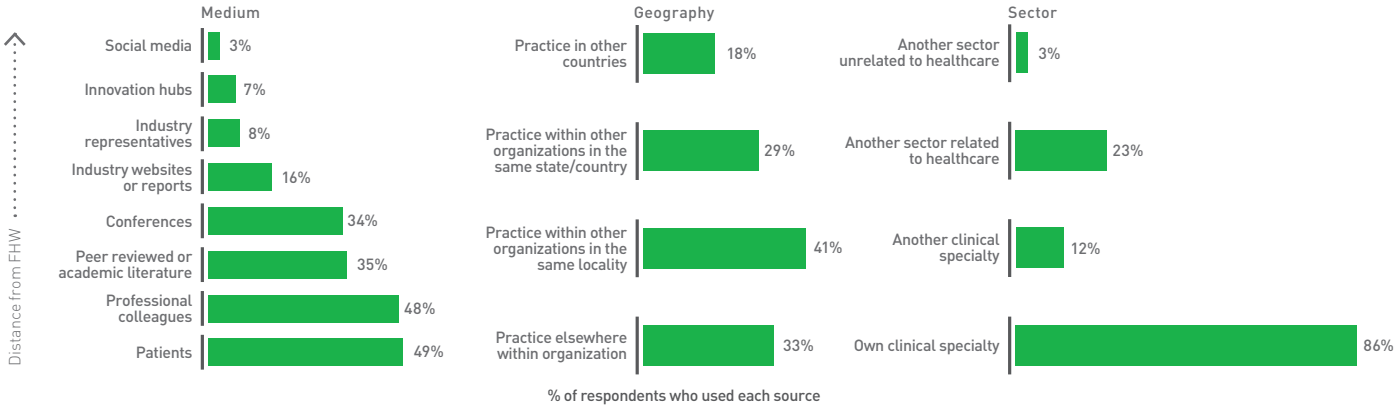
"There are **financing problems** in healthcare, where much more focus is given to service volume versus health-care service quality"

"Healthcare professional **training is highly deficient**. So you end up having to make strong internal investments to train and educate your professionals, and there's always a risk that once you train them, they will go away"

"Our biggest challenge is to **preserve profitability without affecting quality** and without sacrificing investments in innovation and expansion"

Sources of ideas

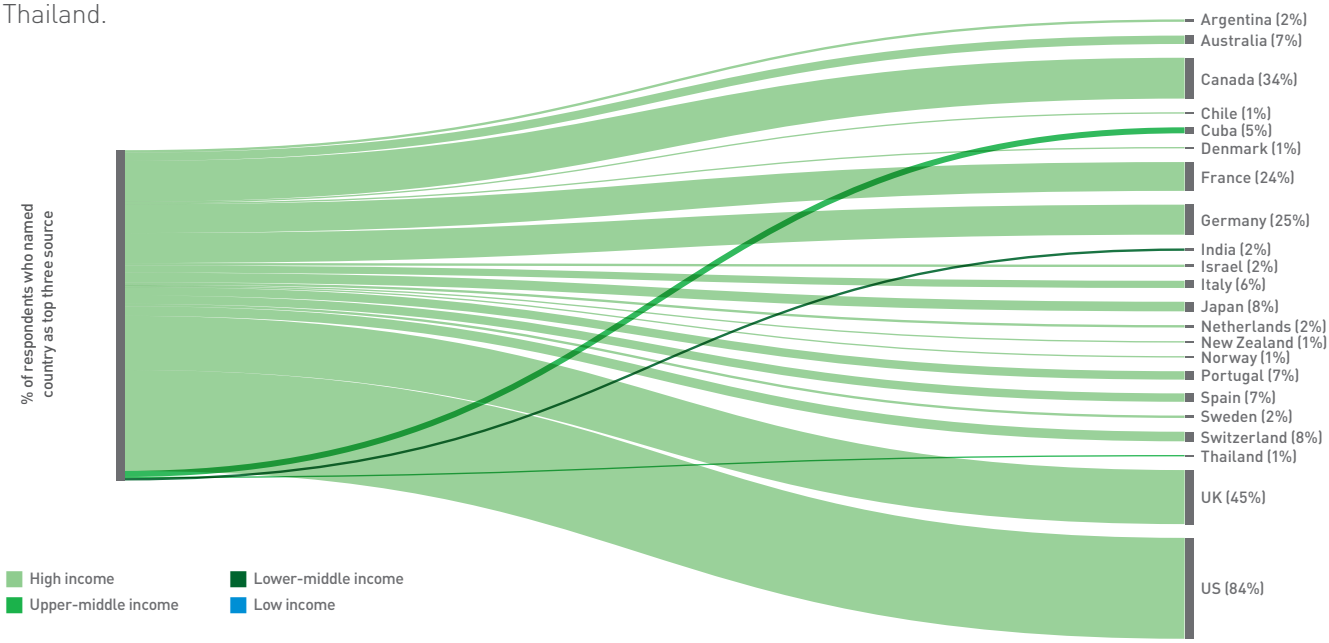
FHWs report sourcing ideas from a wide range of sources; colleagues and patients, and both locally and country-wide. However, FHWs tend to identify most ideas from within their own clinical specialty rather than looking further afield.



Base: 190 online interviews with FHWs

Countries as sources of innovation

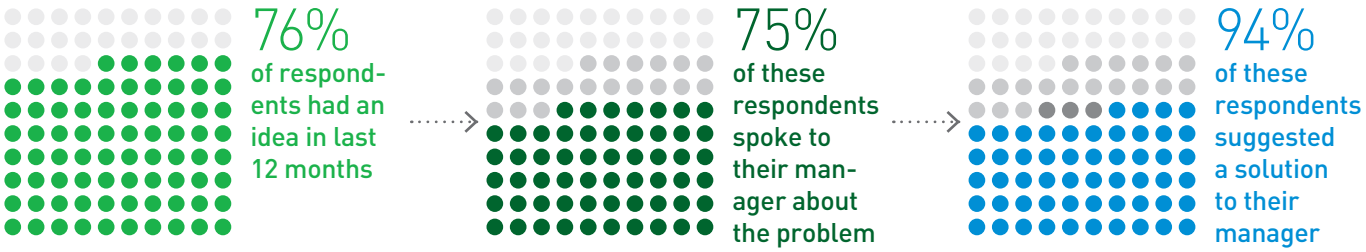
FHWs in Brazil are most likely to look to HICs as useful sources of innovation. They tend to look to these countries for reasons related to perceived high standards, whether in terms of the quality of patient care, the efficiency with which care is delivered, or the quality of research. The only MICs named are Cuba, India and Thailand.



Base: 250 online interviews with FHWs

Process of innovation

A high proportion of FHWs have identified a situation where they wanted to make a change in the past 12 months. Although not all of these went on to speak to their manager about the problem, almost all those who did suggested a solution.



Base: 190 online interviews with FHWs

INDIA

Population
1.3bn

GDP spend on healthcare
4.7%

Health system characteristics

Funding mechanism	Universal publicly funded access, govt funded insurance for low-income access to care; supplemental private insurance available
Management	National policy, regional delivery
Market place	Medium private-sector provision
Economy	Highly competitive
Service delivery	Highly diverse
Current context	Rapidly growing population and socioeconomic inequality are major challenges facing India and its healthcare system

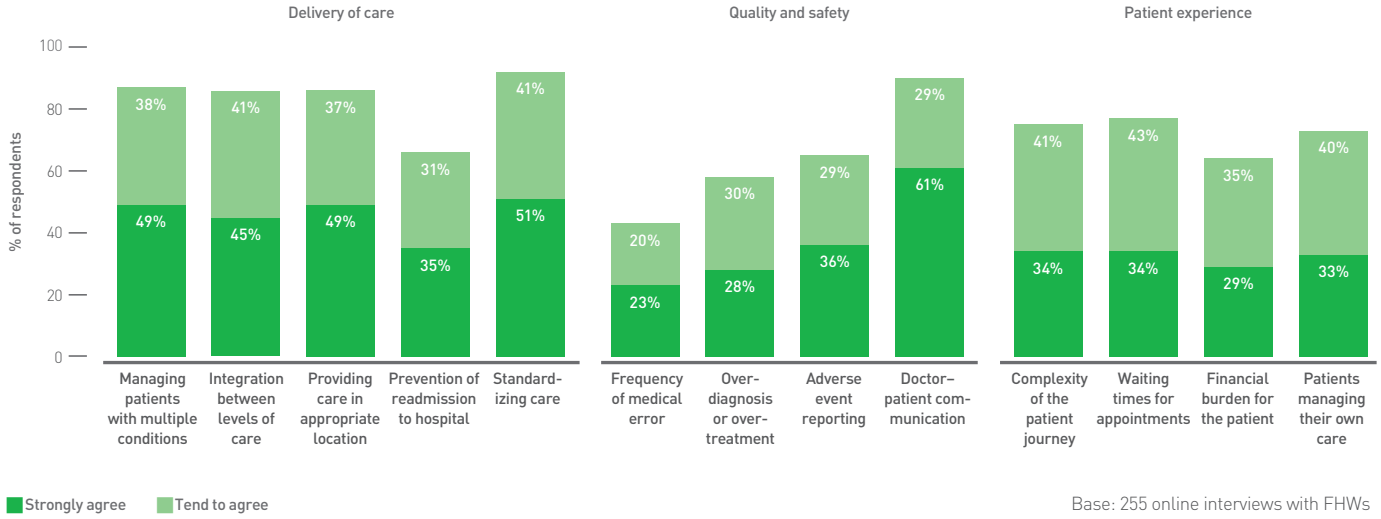
Key findings

- Doctor–patient communication and standardizing care are seen to be the biggest challenges by FHWs in India. Among leaders however, practical concerns such as improving hospital infrastructure and increasing staff numbers are top-of-mind.
- When sourcing new ideas, conferences and social media are particularly important sources for FHWs in India.
- FHWs in India name a mixture of HICs and MICs as useful sources of innovation. They look to these countries for a mixture of reasons, including both perceived similarities with the country and perceived high standards.

Need for innovation

Challenges faced by frontline workers

A number of issues are felt acutely by health workers in India; standardizing care, and doctor–patient communication are among the most frequently cited concerns.



Base: 255 online interviews with FHWs

Challenges faced by leaders

Improving hospital infrastructure and increasing staff numbers to meet growing demand, combined with financial pressures, are the top-of-mind issues for leaders.

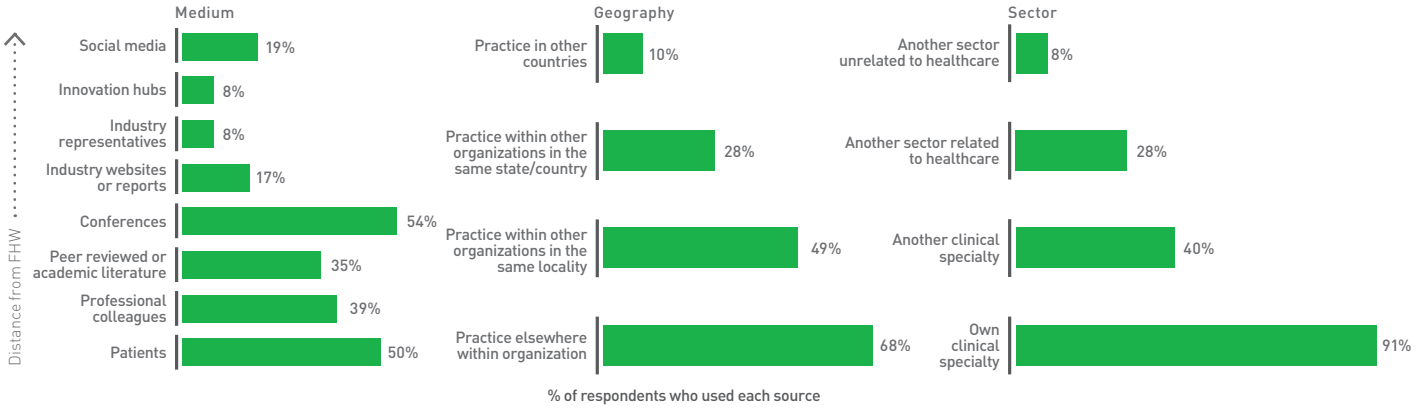
> "One of the challenges that we face is **sourcing of nurses**, which is a big problem across India. To get trained nurses is the most important challenge"

> "We often reach peak **occupancy** which is a problem as we refuse patients. So our next plan is to expand"

> "Getting **well trained nurses** is difficult. Also, doctors remain in the hospital for only six months. We train them, but they don't stay after their training"

Sources of ideas

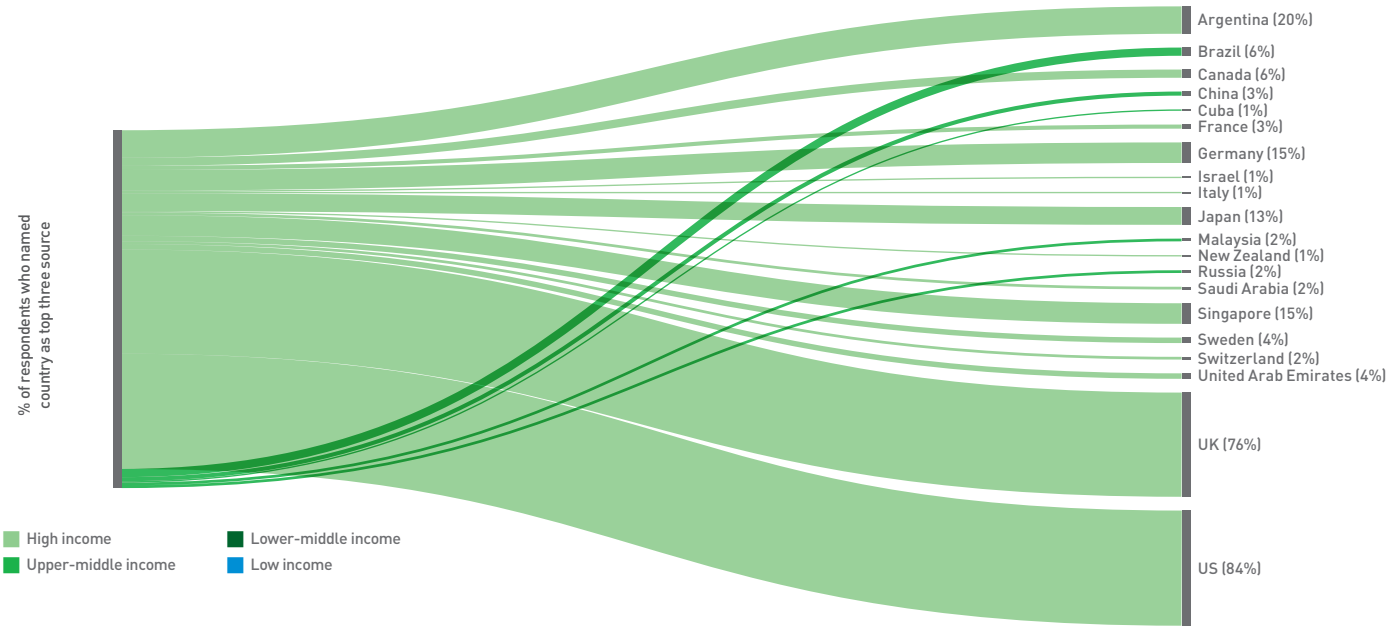
Conferences and social media are particularly important sources of ideas for FHWs in India. Ideas are most likely to be generated from practice elsewhere within a FHW's own organization, and usually from within their own specialty.



Base: 144 face-to-face interviews with FHWs

Countries as sources of innovation

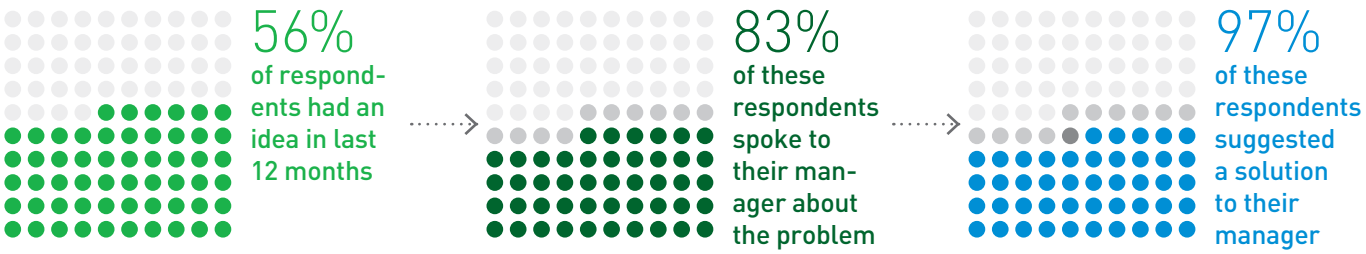
FHWs in India name a mixture of HICs and MICs as useful sources of innovation. They look to these countries for a variety of reasons, including both perceived similarities with the country and perceived high standards.
A shared history with a country is also given as a reason by relatively high proportions of FHWs.



Base: 255 face-to-face interviews with FHWs

Process of innovation

A relatively small proportion of FHWs in India have identified a situation where they wanted to make a change in the past 12 months. Of those who have however, a high proportion have spoken to their manager about the problem, and almost all went on the suggest a solution to their manager.



Base: 144 face-to-face interviews with FHWs

QATAR

Population
2m

GDP spend on healthcare
2.2%

Health system characteristics

Funding mechanism	Univeral publicly funded access – supplemental private insurance available
Management	National delivery of services
Market place	Small private-sector provision
Economy	Little competition
Service delivery	Little regional diversity
Current context	Increasing pressure on state finances has led to the suspension of the National Health Insurance Scheme. Rapid influx of foreign labour has seen population increase by 40% since 2010

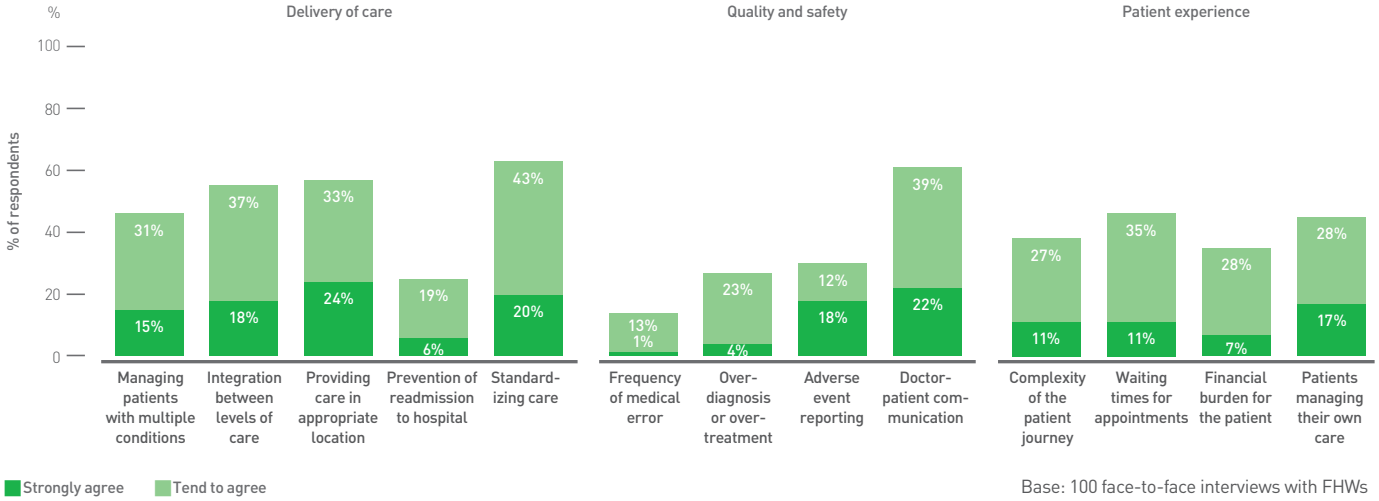
Key findings

- Frontline workers suggest that doctor–patient communication is one of the greatest challenges facing their organization. Leaders highlight the challenges of streamlining organizations that are heavily reliant on foreign workers.
- When sourcing new ideas, industry websites, industry representatives and innovation hubs are particularly important sources for FHWs.
- FHWs in Qatar name a mixture of HICs and MICs as useful sources of innovation. They tend to look to these countries due to their perceived high standards.

Need for innovation

Challenges faced by frontline workers

Frontline workers suggest that standardizing and streamlining care could be improved.



Base: 100 face-to-face interviews with FHWs

Challenges faced by leaders

Leaders highlight the difficulties created by relying on foreign workers; both in terms of recruitment and cultural challenges.

> "Workers are brought from **different countries**; from different schools in terms of education and practice. To make these work at the same rhythm, needs a work of sorcery"

> "We face challenges in **licensing doctors**. It takes eight months to get all of the licenses due to government procedures"

> "The medical staff are from all over the world, so you need to make one **culture** in the hospital before you can provide a good service"

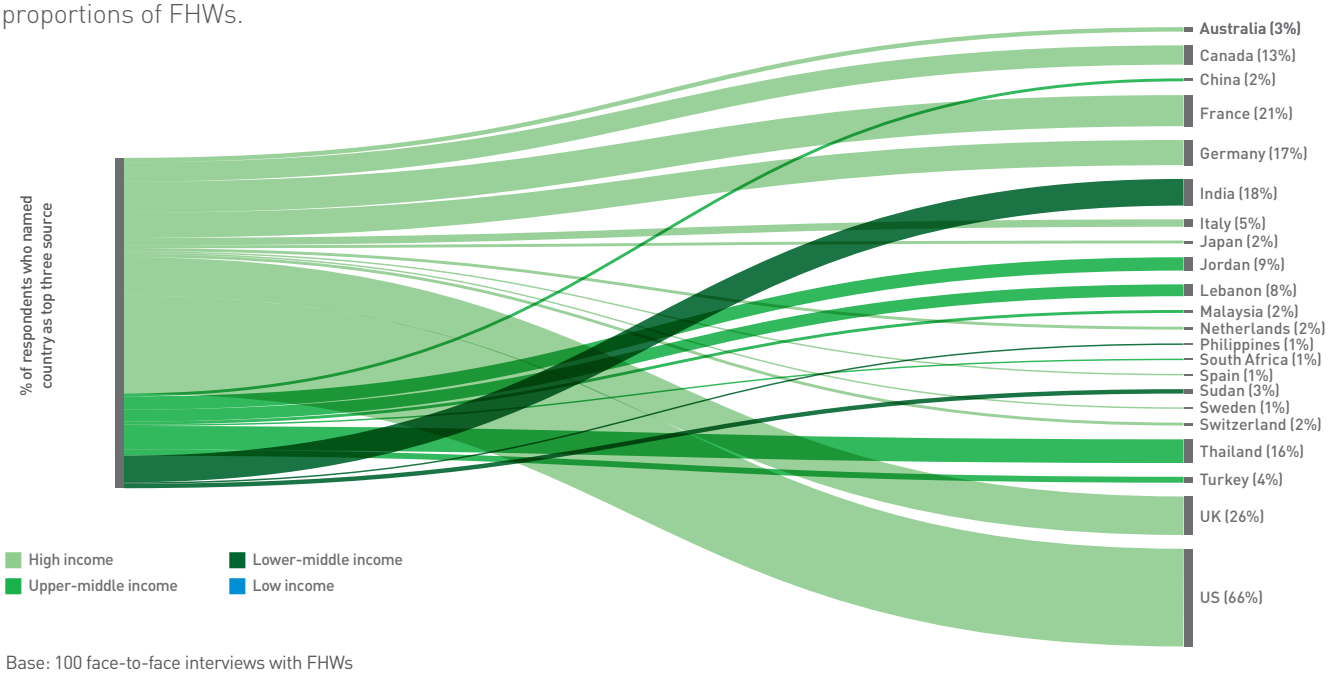
Sources of ideas

FHWs in Qatar are particularly likely to use industry websites, industry representatives, and innovation hubs as sources of ideas. They also frequently look to other countries for ideas, and to sectors related to healthcare.

Base: 14 face-to-face interviews with FHWs
Please note that due to very small base size findings are indicative only

Countries as sources of innovation

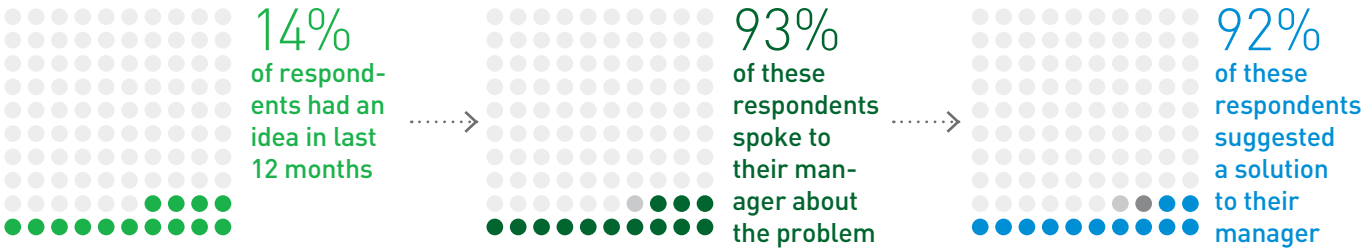
FHWs in Qatar name a mixture of HICs and MICs as useful sources of innovation. They tend to look to these countries due to their perceived high standards; whether in terms of the quality of patient care, the efficiency with which care is delivered, or the quality of research. A shared history with a country is also given as a reason by relatively high proportions of FHWs.



Base: 100 face-to-face interviews with FHWs

Process of innovation

Only a small proportion of FHWs have identified a situation where they wanted make a change in the past 12 months. Of those who have however, almost all spoke to their manager about the problem and suggested a solution.



Base: 14 face-to-face interviews with FHWs
Please note that due to very small base size findings are indicative only

TANZANIA

Population
53m

GDP spend on healthcare
5.6%

Health system characteristics

Funding mechanism	Publicly funded access for the elderly, and pregnant women, etc. supplemented by out-of-pocket payments. National and private insurance available
Management	National policy, regional delivery
Market place	Medium private-sector provision
Economy	Highly competitive
Service delivery	Highly diverse
Current context	The country enjoys political stability, but the strength of the economy fluctuates widely. Poverty remains a significant underlying factor influencing health status. More than half of available hospital beds are occupied by HIV-infected persons

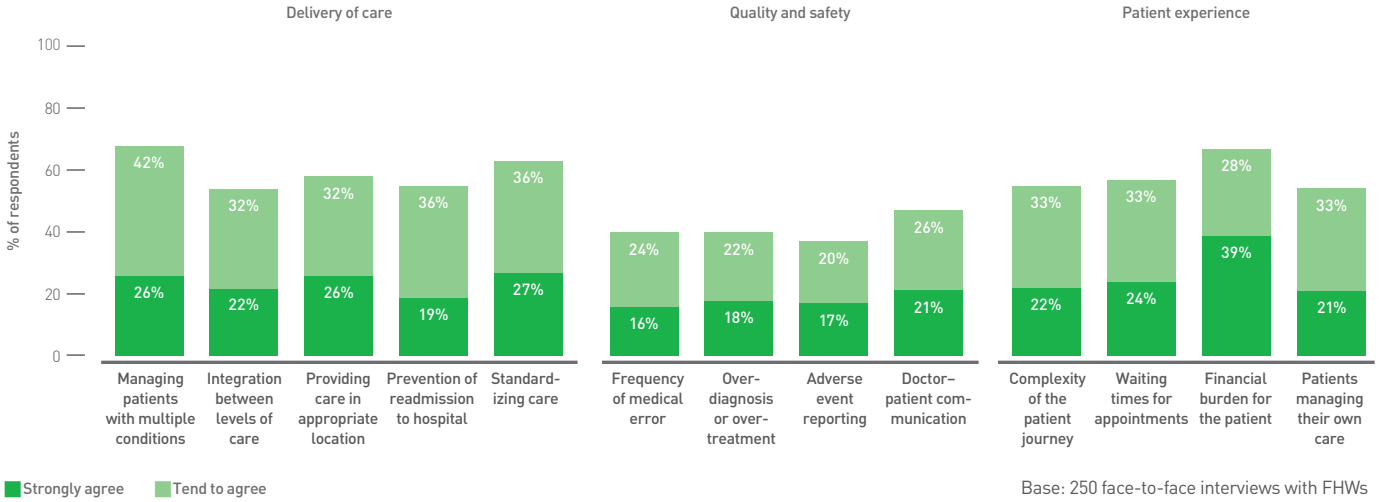
Key findings

- Many FHWs report that the financial burden for the patient is the most prominent challenge facing their organization. Leaders reflect this, citing an inconsistent income, as well as human resources, as the two largest challenges.
- When sourcing new ideas, colleagues, patients, and conferences are particularly important for FHWs in Tanzania.
- FHWs in Tanzania name a broad mixture of HICs, MICs and LICs as useful sources of innovation. They tend to look to these countries due to their perceived high standards.

Need for innovation

Challenges faced by frontline workers

A high proportion of FHWs mention issues around delivery of care – particularly managing patients with multiple conditions. Financial burden for the patient is also a prominent issue according to FHWs.



Base: 250 face-to-face interviews with FHWs

Challenges faced by leaders

Interviews with leaders reveal that human resources and inconsistent income – leading to difficulties paying staff and suppliers – are the two main challenges.

> "The biggest challenge is **staff turnover** because we can't always pay wages on time"

> "The **income** from patients is not constant at all times; sometimes we have many patients sometimes we have fewer patients. But the staff payments are always constant"

> "The biggest challenge is **shortage of workers**; we do not have enough nurses and doctors"

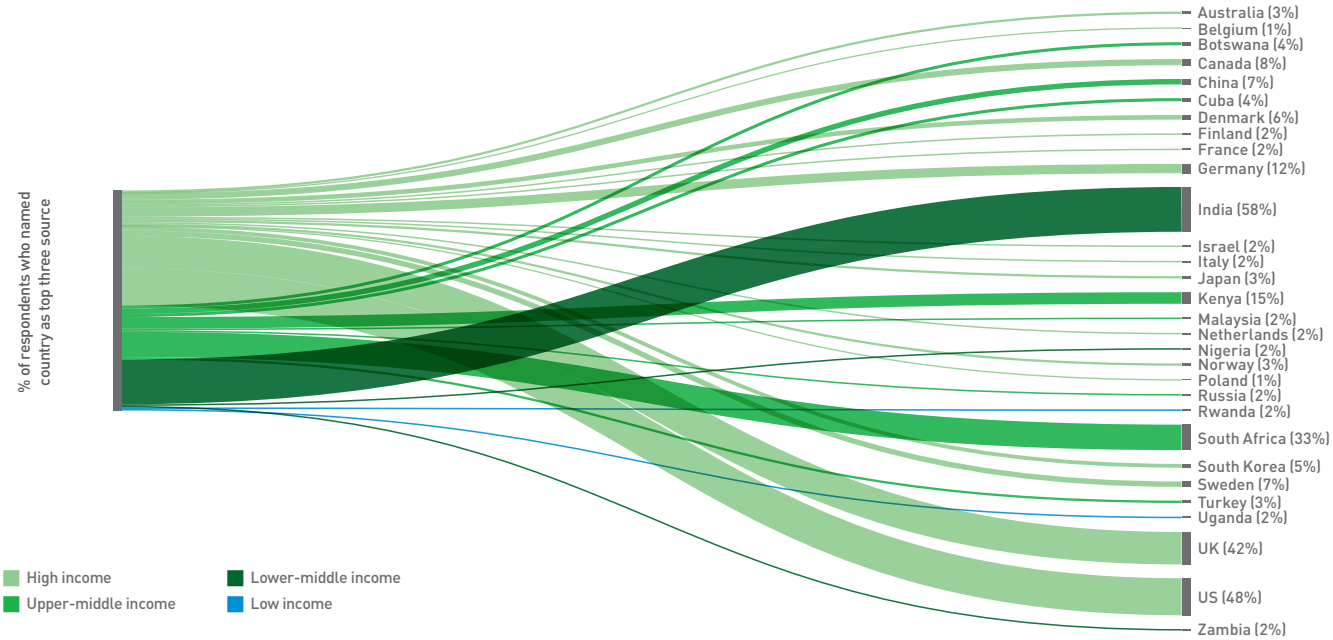
Sources of ideas

Colleagues, patients and conferences are particularly important sources of ideas for FHWs in Tanzania. Ideas are drawn from organizations across the country and from different specialties and sectors.

Base: 178 face-to-face interviews with FHWs

Countries as sources of innovation

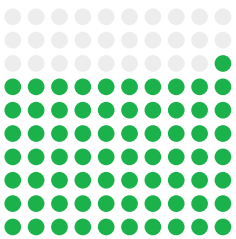
FHWs in Tanzania name a broad mixture of HICs, MICs and LICs as useful sources of innovation. They tend to look to these countries due to their perceived high standards, whether in terms of the quality of patient care, the efficiency with which care is delivered, or the quality of research.



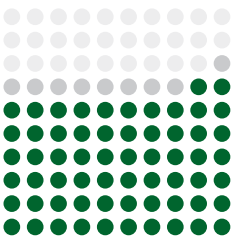
Base: 250 face-to-face interviews with FHWs

Process of innovation

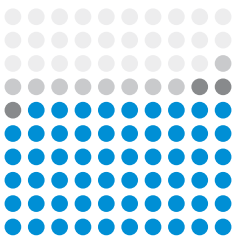
A high proportion of FHWs have identified a situation where they wanted to make a change in the past 12 months. Although not all of these went on to speak to their manager about the issue, almost all those who did suggested a solution.



71% of respondents had an idea in last 12 months



87% of these respondents spoke to their manager about the problem

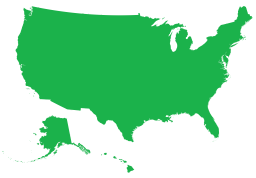


95% of these respondents suggested a solution to their manager

Base: 178 face-to-face interviews with FHWs

UNITED STATES

Population
321m



GDP spend on healthcare
11%

Health system characteristics

Funding mechanism	Publicly funded access for low-income and elderly. Individual and employer provided insurance
Management	National policy, regional delivery
Market place	Predominantly private provision
Economy	Highly competitive
Service delivery	Highly diverse
Current context	The healthcare system has been reformed under the Affordable Care Act. The 2016 presidential election could see political and economic change

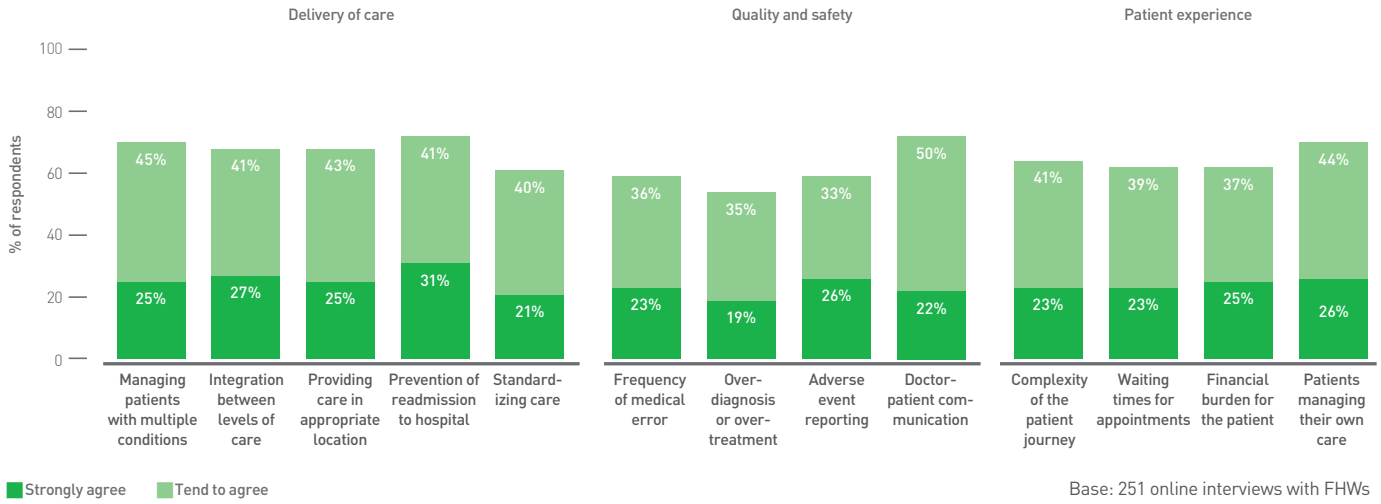
Key findings

- Issues relating to the delivery of care are mentioned frequently by FHWs in the US, whereas leaders highlight the challenges posed by changes to funding due to the Affordable Care Act and the difficulties posed by increasing demand.
- Only a small proportion of FHWs in the US source ideas from other countries. Sources also tend to be restricted to the FHWs own specialty, with only small proportions gaining an idea from other sectors.
- FHWs in the US almost exclusively name other HICs as useful sources of innovation. They tend to look to these countries due to their perceived similarities.

Need for innovation

Challenges faced by frontline workers

Issues relating to the delivery of care mentioned frequently by FHWs in the USA, whereas issues surrounding quality and safety are less prevalent.



Base: 251 online interviews with FHWs

Challenges faced by leaders

Leaders highlight the challenges posed by changes to funding due to the Affordable Care Act and the difficulties posed by increasing demand.

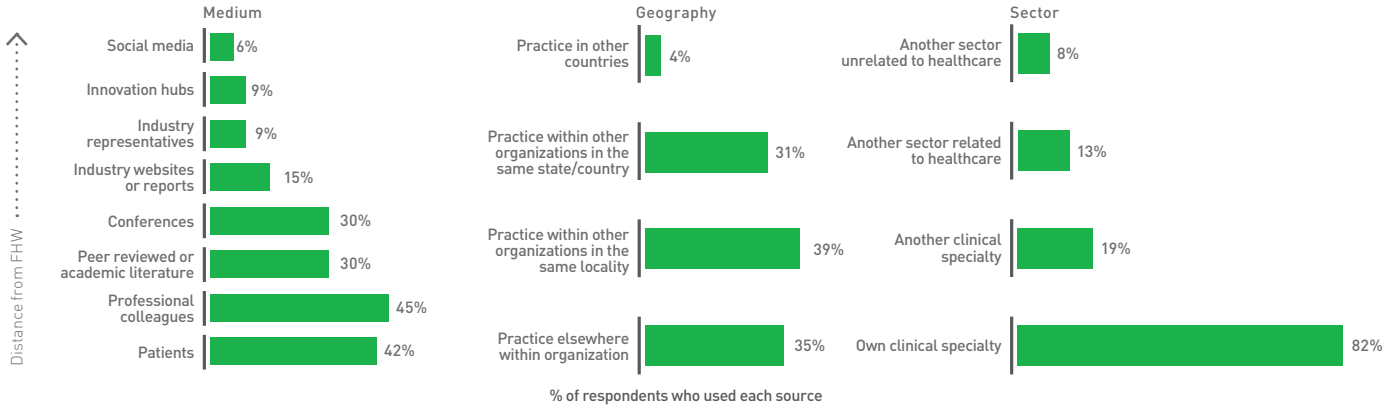
> "**Reimbursement is very uneven**, and it does not always pay enough to provide the services that you'd like to provide"

> "Because of the Affordable Care Act's impact on hospitals like ours, **financially** most of the systems have now been compromised"

> "Nothing ever gets taken away. It's just more and more gets piled on top and the only way you can survive in that environment is to actually make things generally more **efficient**"

Sources of ideas

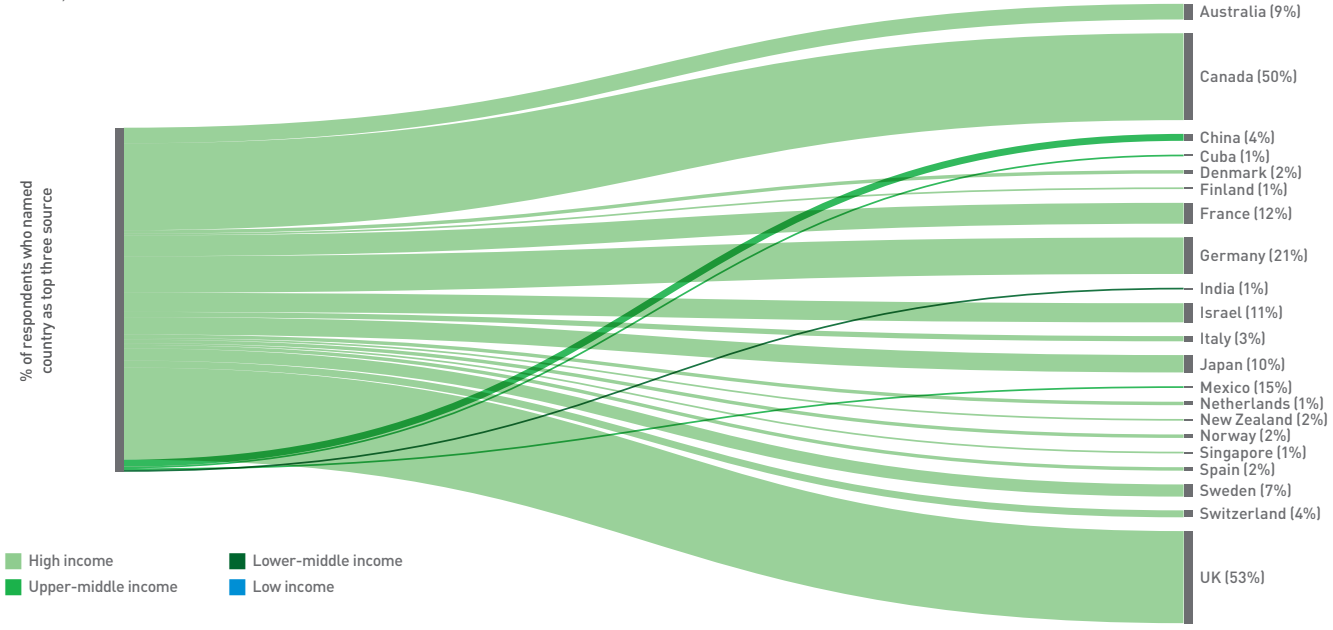
Only a small proportion of FHWs in the US source ideas from other countries. Sources also tend to be restricted to the FHW's own specialty, with only small proportions gaining an idea from other sectors.



Base: 180 online interviews with FHWs

Countries as sources of innovation

FHWs in the US almost exclusively name other HICs as useful sources of innovation. They tend to look to these countries due to their perceived similarities; whether in terms of populations, health systems, health problems, cultural practices or political and economic systems. The only MICs named (by small numbers) are China, India, Cuba, and Mexico.



Base: 251 online interviews with FHWs

Process of innovation

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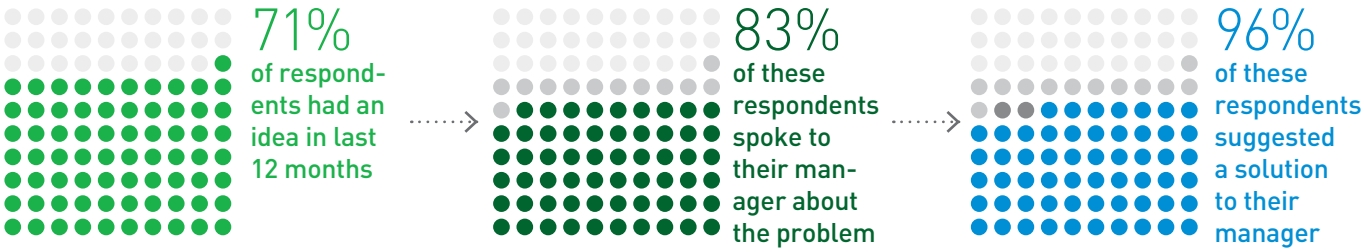

Base: 180 online interviews with FHWs

ABBREVIATIONS

ACA	Affordable Care Act
APHFTA	Association of Private Health Facilities
ATI	Administrative Training Institutes
CECAN	Centre for the Evaluation of Complexity Across the Nexus
CEO	Chief Executive Officer
CFO	Chief Financial Officer
CIPS	Centre for Innovation in Public Systems
CHMI	Center for Health Market Innovations
FHW	Frontline Health Worker
GDHI	Global Diffusion of Healthcare Innovation
HIC	High-income country
IHI	Institute for Healthcare Improvement
IGHI	Institute of Global Health Innovation, Imperial College London
ISO	International Organization for Standardization
LIC	Low-income country
MHIN	Mental Health Innovation Network
MIC	Middle-income country
NGO	Non-governmental organization
NHSEIU	NHS England Innovation Unit
NHSIQ	NHS Improving Quality
OECD	Organization for Economic Cooperation and Development
QCI	Quality Council of India
QMIC	Qatar Medical International Congress
UK	United Kingdom
US	United States of America
WISH	World Innovation Summit for Health

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We would like to extend our sincere thanks to the following people who contributed their unique insights to this report:

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Gianluca Fontana | Senior Policy Fellow and Director of Operations

Jessica Prestt | Forum Director, WISH

Hannah Patel | Head of Forum Development, WISH

Ipsos MORI

Predrag Kurcubic | Project Director

Anna Quigley | Quality Director

Emily Gray | Project Consultant

Sylvie Hobden | Research Manager

Anna Carluccio | Research Director

Ewa Ochman | Quantitative survey lead

Stephanie Crowe | Qualitative interview lead

Charles Levy | Associate Director

LIST OF INTERVIEWEES

Of the 99 healthcare leaders and curator organization representatives that were interviewed, 86 gave their consent for their name to be included in a list of expert participants in this report. Thirteen experts preferred to contribute anonymously.

Mr Richard Alexander, Chief Financial Officer, Imperial College Healthcare NHS Trust – England
Dr Samuel Amirfar, Chief Medical Information Officer, The Brooklyn Hospital Center – US
Dr Nick van As, Medical Director, The Royal Marsden NHS Foundation Trust – England
Dr Abdul Azeem, Medical Director, Al-Ahli Hospital – Qatar
Dr Adel Aziz, Head of Accreditation, Research and Continuing Education, Al Emadi Hospital – Qatar
Dr David Blumenthal, President and Chief Executive Officer, The Commonwealth Fund – US
Mr Michael Burke, Senior Vice President and Vice Dean/Corporate Chief Financial Officer, NYU Langone Medical Center – US
Ms Lodel Yerro Caplan, Community Services Coordinator, Torrance Memorial Medical Center/Chairwoman, Healthcare Executives of Southern California – US
Mr Chris Chadwick, Hospital Director, Spire Manchester Hospital – England
Mr John Connolly, Patient Safety Policy Fellow, Institute of Global Health Innovation, Imperial College London – England/Qatar
Dr Muganyizi Daniel, Hospital Director, Mbweni Hospital – Tanzania
Ms Angela Dawe, Director of Operations and Strategic Development for Adult Local Services, Guy's and St Thomas' NHS Foundation Trust – England
Dr B P Dhami, Medical Superintendent/Director, Shakuntala Nursing Home – India
Ms Donika Dimovska, Senior Program Director, Center for Health Market Innovations, Results for Development – US
Ms Jane Dwelly, Head of Health and Care Innovation, NHS England – England
Dr Christiano Felippe, Clinical Director, Hospital Sancta Maggiore – Brazil
Dr Evandro Félix, Executive Manager, Hospital do Coração – Brazil
Mr Evandro Feres Furlan, Division Director/Hospital Administrator – Hospital do Ipiringa, Brazil
Dr Fernando Ferry, General Director, Hospital Universitário Gaffrée e Guinle – Brazil
Dr Luiz Melo Amorim Filho, General Director, Hemorio – Brazil
Mr Allan Fine, Executive Vice President and Chief Strategy and Operations Officer, The New York Eye and Ear Infirmary of Mount Sinai – US

Mr Declan Flanagan, Medical Director, Moorfields Eye Hospital NHS Foundation Trust – England
Dr John H Griffith, Corporate President and Chief Executive Officer, Kedren Community Health Center – US
Dr Timothy S Hall, Chairperson of the Department of Surgery, Coney Island Hospital – US
Ms Siobhan Harrington, Deputy Chief Executive, The Whittington Hospital – England
Dr Sally Hodges, Director of Children, Young Adults and Families, Tavistock and Portman NHS Foundation Trust – England
Dr Amer Homs, Chief Executive Officer, Al Razi Medical Center – Qatar
Mr Akthar Hussein, Hospital Manager, Cygnet Hospital Ealing – England
Dr Guilherme Xavier Jaccoud, Medical Director, Hospital Casa Evangélico – Brazil
Dr Brent James, Chief Quality Officer, Intermountain Health – US
Dr V. Jayaraman, Medical Superintendent, SRM Hospital – India
Prof. Joffre Amim Júnior, General Director, Maternidade Escola Federal, URFJ – Brazil
Dr Sarah Kaghula, Hospital Director, Vijibweni Hospital – Tanzania
Dr Mohamed Al Kalla, Executive Director, Marwan Kalla Medical Center – Qatar
Dr John Kane, Senior Vice President for Behavioral Health Services, Zucker Hillside Hospital – US
Dr Theresia Katunu, Health Secretary, Kaloleni Hospital, Tanzania
Dr Yousef Al Kayali, Chief Executive Officer, Al Khaili Medical Center, Qatar
Prof. Daniel Keenan, Associate Medical Director, Appraisal and Revalidation, Central Manchester University Hospitals NHS Foundation Trust – England
Dr Vinod Khetarpal, Owner/Director, Khetarpal Nursing Home – India
Dr Joseph Kiani, Associate Director, Mbagala Rangi Tatu Hospital – Tanzania
Dr Peter Kibantu, Hospital Manager, Uhuru Hospital Mwanza – Tanzania
Dr Hany Al Kilani, Medical Director, Hamad Al Khor Hospital – Qatar
Dr John Kimario, Deputy Hospital Manager, Sekou Toure Hospital, Tanzania
Mr Emmanuel Kimario, Hospital Manager, Marie Stopes Hospital Mwenge – Tanzania
Ms Angela A Kimati, General Secretary, Mount Meru Regional Hospital – Tanzania
Mr Vishwanath Kotikar, Chief Operating Officer, Parakh Hospital – India
Dr Kapil Kumar, Director, Department of Oncology, BL Kapur Memorial Hospital – India
Dr Tanya Lodh, Medical Superintendent and Branch Head, RG Stone Urology and Laparoscopy Hospital – India
Dr Emmanuel Malima, Deputy Hospital Manager, Temeke Municipal Hospital – Tanzania

Dr Lewis Marshall, Chairman of Ambulatory Care and Community Health, The Brookdale University Hospital and Medical Center – US

Dr Anish Mary, Senior Consultant, Medical Oncology, Manav Seva Trust – India

Ms Emmy Masenga, Hospital Manager, Kairuki Hospital – Tanzania

Mr Philip Mazzara, President and Chief Executive Officer, Providence Health Foundation – US

Mr Ravi Krishna Moorthy, Exhibition Manager, Qatar International Medical Congress, Qatar

Dr Delilah Moshi, Deputy Hospital Director, Mwananyamala Hospital – Tanzania

Mr Martin Mosi, Managing Director, Masana Hospital – Tanzania

Dr Hugolin Msele, Deputy Hospital Director, Sinza Palestina Hospital – Tanzania

Mr Samma Augustine Msola, Chief Executive Officer, Mikumi Hospital – Tanzania

Dr Patrícia Ribeiro de Oliveira Neto, Medical Director/Technical Manager, Hospital Israelita Albert Sabin – Brazil

Mr Tiaro Fernandes Neves, Administrative Director, Hospital da Sagrada Família – Brazil

Ms Melanie Ogden, Head of Innovation Delivery, NHS England – England

Dr Lynne Opitz, Associate Chairman for Pathology Medicine, Staten Island University Hospital – US

Dr A Pandian, Managing Director, Deepam Hospitals – India

Dr José Antonio Matos Páramo, Technical Director, Hospital Casa de Portugal – Brazil

Dr Tammy Peacock, Director, Northern Virginia Mental Health Institute – USA

Mr Andrew Pearson, Executive Medical Director, Royal Orthopaedic Hospital, NHS Foundation Trust – England

Mr Robert Pellechio, Vice President, Corporate Pharmacy, Clara Maass Medical Center – US

Dr Osman Ramadan, Medical Director, Doha Clinic Hospital, Qatar

Dr Jayshree Ray, Chief Executive Officer, Ruby General Hospital – India

Dr H David Reines, Vice Chairman, Quality, Outcomes and Patient Safety, Inova Fairfax Hospital – US

Ms Grace Ryan, Co-Lead, Mental Health Innovation Network, Centre for Global Mental Health – England

Dr Khaleel Al-Sahli, Medical Director, American Hospital – Qatar

Dr Marcelo Sampaio, Clinical Director, Hospital Alemão Oswaldo Cruz – Brazil

Dr Kunal Sarkar, Senior Vice Chairman and Board Member, Medica Superspecialty Hospital – India

Ms Farheen Shaikh, Medical Administrator, Criticare Hospital – India

Dr Nischal Shetty, Owner, Balaji Hospital – India
Mr John Short, Chief Executive, Birmingham and Solihull Mental Health NHS Foundation Trust – England
Mr Joe Smyth, Chief Operating Officer, The Hillingdon Hospitals NHS Foundation Trust – England
Dr Brad Spellberg, Chief Medical Officer, LAC+USC Medical Center – US
Mr Roger Spencer, Chief Executive, The Christie NHS Foundation Trust – England
Dr Elham Mustafa Mohammad Fowzy Sulaiman, Deputy Director for Development, Queen Medical Center – Qatar
Dr V S Suresh, Managing Director, Pavithra Hospital – India
Ms Lorraine Thomas, Service Transformation Director, Birmingham Community Healthcare NHS Foundation Trust – England
Dr Murthy Venkateswaran, Chief Executive Officer, SANITAS Hospital – Tanzania
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