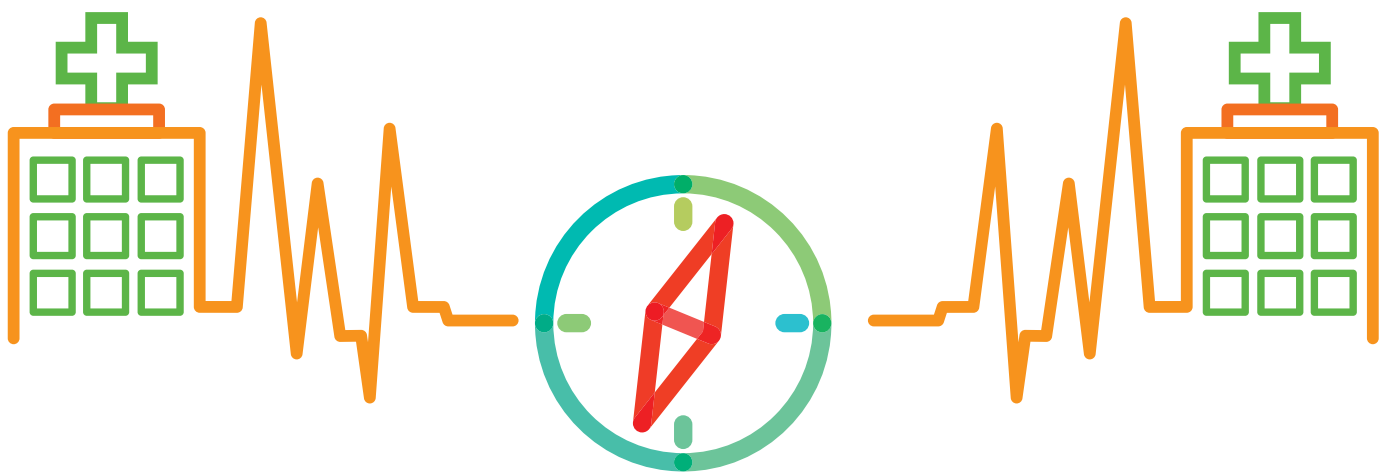# World Health Organization

Partnerships for safer health service delivery:

Evaluation of WHO African Partnerships for Patient Safety 2009-2014

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World Health Organization

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"Only by working together can we address this public health issue, strengthen health systems and make the delivery of health care safe for every patient in Africa, every time."

Dr Marie-Paule Kieny
Assistant Director-General, Health Systems and Innovation WHO[1]

1 WHO African Partnerships for Patient Safety (homepage): http://www.who.int/patientsafety/implementation/apps/en/.

FOREWORD

This evaluation of African Partnerships for Patient Safety (APPS) is the third in a series of evaluations issued since 2009 *(1, 2)*. It focuses predominantly on the results of the second wave of partnerships and explores the programme's impact on the safety and strengthening of health care service delivery. The findings are of particular relevance in the current global health context. As the report describes, APPS is concerned with building the necessary resilience to ensure that hospitals can withstand shocks such as those posed by the recent outbreak of Ebola virus disease in West Africa.

The report describes the perceived and actual value that hospital-to-hospital partnerships add and whether, and to what extent, such a model can stimulate the spread of patient safety and infection prevention and control (IPC) improvements beyond immediate partnership hospitals. Better health is a basic human right, inextricably linked to development. The places where people go to be treated for disease should not themselves act as a source of harm. In a single study of just 26 hospitals across WHO's African and Eastern Mediterranean Regions, half a million people were affected by unsafe health care, with over 10 000 deaths. Extrapolated across the African Region this constitutes enormous human and economic costs – potentially millions of people dying unnecessarily. Too many people across the African Region are being harmed and killed as a result of unsafe health care. The 2014 Ebola virus disease outbreak is a stark example of the magnitude of harm and death that results from weak health systems and absent patient safety structures. Given all of this, it is worthy of note that until very recently patient safety had not received the full attention it deserves in the region. The findings of this evaluation will be of immense interest, not only to the programme donors (the intended audience of this report), but to other actors in global health who can gain a better understanding of how an innovative yet simple approach has potential to help in efforts to build health system resilience at pace and scale – to maximize health and safety and minimize future patient and population harm.

Health care-associated infection is a patient safety problem, one that is compounded by weak infrastructures and fragile health systems. Again, Ebola virus disease has taught us many lessons in this regard. Furthermore, simple low-cost technologies that facilitate interventions such as hand hygiene, for example alcohol-based hand rubs, play a crucial role in reducing the likelihood of health care-associated infection. However, there is a global inequity. Many hospitals in sub-Saharan Africa continue to have erratic water supplies and virtually no access to these simple yet life-saving technologies.

The APPS model is aimed at strengthening patient safety and IPC at the national and hospital level through hospital-to-hospital partnerships, supported by ministries of health and WHO regional and country offices. Safer health care assists countries in their preparedness and response not only to Ebola virus disease but also to other patient safety threats that will no doubt emerge in the future. Stronger and safer health systems and service delivery now and in the future are a crucial part of the public health infrastructure, necessary as universal health coverage becomes a reality. Effective, efficient, high-quality, safe and person-centred health care delivery is also critical to protect the world from the threat of antimicrobial resistance. As WHO stated in 2011, "no action on IPC today – no cure tomorrow".[2]

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2 World Health Day, 7 April 2011 – Antimicrobial resistance: no action today, no cure tomorrow http://www.who.int/world-health-day/2011/en/.

As this report illustrates, APPS has contributed to a patient safety movement that is gathering pace. This report tells the story of APPS, the lessons that can be learned and most importantly how institutional partnerships can contribute to sustainable global health interventions. APPS provides an entry point to improving patient safety through hospital partnerships – global solidarity based on the programme theory of change. APPS feeds the knowledge pool on patient safety partnerships, helping to clarify what works and does not work. As the report highlights, the link with national systems is key. The partnership model is now ripe for further expansion and development to ensure the architecture constructed to date contributes in the most effective way to global health.

Dr Edward Kelley

Director, Service Delivery and Safety Department
World Health Organization
Geneva

ACKNOWLEDGEMENTS

ABBREVIATIONS

APPS	African Partnerships for Patient Safety
CBO	community-based organization
CSV	case study vignette
ESTHER	Ensemble pour une Solidarité Thérapeutique Hospitalière en Réseau
HHSAF	hand hygiene self-assessment framework
HUG	Hôpitaux Universitaires de Genève
IAPO	International Alliance of Patient Organizations
IPC	infection prevention and control
NGO	nongovernmental organization
NHS	National Health Service
POPS	Private Organizations for Patient Safety
PSSA	patient safety situational analysis
THET	Tropical Health Education Trust
WHO	World Health Organization

"With this process has come a greater awareness of how simple interventions can improve patient safety. This has subsequently prompted a broader look at the hospital systems, patient pathways and surveillance/data collection systems, leading to other directly/indirectly related interventions that will help to improve patient safety.

The partnership and checklist introduction has been a great 'eye-opener' to the concept of how improvements in systems and data collection can significantly improve patient safety. This realization in itself has been a great catalyst for change for some motivated individuals. The realization that many of these changes can be achieved with little/no financial burden has also been a great boost for change."

Ndola Central Hospital-Guy's and St Thomas' NHS Foundation Trust
Final Partnership Report, 2013

EXECUTIVE SUMMARY

Finding 1: Sustainable, tangible improvement in patient safety and service delivery has been noted across all partnerships with an emphasis on structures and processes as well as development of hospital policies, and the strengthening and in some cases establishment of training programmes. The African Partnerships for Patient Safety (APPS) model provides a robust framework in support of multiprofessional involvement, and offers a structured way to align the philanthropic, volunteering work that health partnerships are built upon with a hard edge of strategic work related to patient safety and quality improvement. The APPS approach provides a tangible entry point for action, centred on patient safety and infection prevention and control (IPC), that unites disease-specific programmes and health systems. This has the potential to build capacity around epidemics and pandemics per se, and can be effectively translated into activity to strengthen front-line country-level responsiveness.

Finding 2: APPS is stimulating change at the hospital and policy level through technical cooperation. The greatest return on investment is realized when partners have access to high-quality, easy-to-use technical resources alongside partnership collaboration to support local improvement. This is evident in addressing the immediate challenge of improving access to hand hygiene products through local capacity-building workshops, the collaboration with the World Health Organization (WHO) Private Organizations for Patient Safety (POPS) and the move to include hand sanitizers on the WHO Essential Medicines List.

Finding 3: Partnerships provide a vehicle for dialogue that generates ideas and opportunities, influenced by the vision of the programme, to address the multiple barriers to improvement.

The focus on solution generation co-developed by the hospital partnerships is of particular note. Such co-development supports improvement and mutual benefits are being realized.

Finding 4: APPS has contributed to strengthening patient safety processes in the National Health Service (NHS), including compliance with surgical checklists, policy development and approaches to training. This flow-back effect on the NHS is particularly noted in relation to the development of leadership skills, resource awareness and problem-solving capabilities.

Finding 5: The partnerships appear to have acted as a catalyst for change that would otherwise not have happened, or happened more slowly in the absence of a supportive and facilitative partnership environment. The results seem to have been influenced by a combination of WHO facilitation, local energy and commitment, and national acknowledgement of the importance of patient safety work, illustrating that even when patient safety is at an immature stage, substantial progress can be made with committed individuals and a supportive, facilitative framework.

Recommendation 1: **Patient safety policy strengthening**. The evaluation findings will be used to support the emerging drive for national patient safety policy and strategy in the African Region, including funding. The benefits to the NHS (and European) organizations will be leveraged and opportunities for future financial support explored to further develop APPS at the global level.

Recommendation 2: **Promotion of hospital-to-hospital partnerships to strengthen services.** The evaluation findings will be used as a basis to advance patient safety partnerships

as a vehicle for addressing some of the critical global health challenges of our time; as part of the post-Ebola virus disease resilience agenda and in initially reactivating essential health services in affected countries; to co-develop thinking on integrated people-centred care; to design integrated service provision within the context of universal health coverage; and to build local capacity to address the global antimicrobial resistance challenge.

Recommendation 3: **Further development of the partnership model to maximize impact.** Building on the collaborative work with national and international stakeholders and communities and patient groups with a focus on POPS, work

will continue to address inequities, barriers to affordability, and impediments to supply and distribution of essential IPC products in Africa.

Recommendation 4: Development of a comprehensive communication and dissemination strategy. This will be undertaken to ensure findings reach all key actors, including international nongovernmental organizations, to enhance spread of knowledge in this emerging field of enquiry.

Recommendation 5: **Building on the community engagement findings.** Work will take place to strengthen service delivery with a focus on the post-outbreak Ebola context.

This report is one of the final outputs of the WHO African Partnerships for Patient Safety (APPS). APPS was established as a programme in 2009, a response to the ministerial commitment and mandate for patient safety action from all 47 ministries of health in the WHO African Region obtained at the 58th session of the WHO Regional Committee for Africa. It was funded initially through a grant from the United Kingdom Department of Health. Between the summer of 2009 and May 2014 APPS was developed, implemented and evaluated. APPS has employed a hospital-to-hospital partnership approach that has resulted in 17 hospital-to-hospital partnerships spanning France, Switzerland, the United Kingdom, and countries in the WHO African Region. Since 2013 the APPS network has been opened up to any hospital partnership anywhere in the world. Currently there are almost 100 members of the APPS network spanning 39 countries. This report focuses primarily on evaluation of the second wave of APPS partnerships, with an emphasis on United Kingdom–Africa hospital partnerships.

The programme theory of change is that North–South hospital-to-hospital partnerships add value to conventional approaches to improve the safety of health care and facilitate improvement via shared learning and the opportunity to co-develop approaches and resources. Local hospital activity drives action, supported by parallel advocacy and engagement at the national and regional policy level. Such a programme delivers short- and long-term outcomes that have the potential to have an impact on the safety of service delivery, lives saved and reduced costs.

Improving the safety of hospitals requires action at many levels of the health system and is influenced by existing local and national structures, including human resources and economic factors as well as the prevailing culture within an organization. There is a growing body of evidence on the extent of harm caused by unsafe health care, including health care-associated infections, suggesting that millions of lives could be saved with rudimentary improvements in systems and processes of treatment and care. Available data also suggest that Africa shares the worldwide trend of increasing drug resistance to microbes that can be spread both in hospitals and in the community.

IPC and patient safety can act as a bridge between disease-specific programmes and health systems and therefore play a role in strengthening the interaction at the health facility level. Evidence on the role of hospital-to-hospital partnerships in improving patient safety is beginning to emerge; however, this is an underresearched area, making this evaluation of critical importance in the global health arena.

This report is a summary of the findings of the programme focused predominantly on five countries in Africa and five NHS organizations in the United Kingdom. Evaluation centres on the critical question: *Can the establishment of hospital-to-hospital patient safety partnerships between Europe and Africa contribute to improvement in the safety of hospitals in Africa and therefore ultimately make it more likely that health care will be safer, patient safety errors reduced, lives saved and costs contained?*

During the period of evaluation there has been important progress in the safety of health care in African partner hospitals, in the strength of the partnerships themselves and in the area of patient safety spread. The detailed evaluation findings provide numerous examples to support this, including the use of short case study vignettes.

Improving IPC was a common focus across all partnerships, and there are some striking examples of progress using WHO assessment tools. In addition, all partners in the African Region were trained on local production of a WHO formulation for life-saving hand sanitizers. A systematic focus on patient safety using the APPS approach therefore appeared to be catalytic in improving wider service delivery. There are further examples of progress in relation to safe surgery, training and education of health care workers, medication safety, health care waste management, clinical audit, and teamwork and leadership.

The use of established partnerships contributed to strong perceptions relating to the multiple dimensions of partnership strength, including solidarity around a shared vision, respect and decision-making. Communication, sharing of information, and institutional and stakeholder engagement all improved during the period of evaluation.

All African partners cited evidence of in-country spread, and mechanisms for hospital–community linkages were developed in each partnership hospital to enhance spread. At the programme level, APPS contributed to the development by the WHO Regional Office for Africa of a tool for national patient safety policy and strategic plan development, which has been disseminated across the region. This resulted in a call for "implementation-driven" policy action, representing a step change in routine policy-making processes.

The partners experienced multiple barriers in their efforts to improve patient safety and IPC relating to infrastructure, financial and human resources, knowledge, leadership and teamwork, engagement of local communities and the partnership approach itself.

Partners described a number of tangible benefits to the NHS as a result of participation in the programme, and there was also some evidence of reverse innovation. APPS participation was cited as presenting an opportunity for organizations to fulfil their corporate social responsibility. Technology developed in the United Kingdom for auditing purposes was trialled in an African partner hospital, and adjustments made to suit this context were found to enhance operations back in the NHS. Beyond the second-wave partnerships there is also strong evidence of reverse innovation in the United States of America, where a research project is currently utilizing the APPS approach to community engagement in East Baltimore.

Two years is a relatively short time frame to demonstrate impact in all but the basic structures and processes, even in mature health systems with a track record of success in quality and safety improvement. However, there are some clear illustrations of achievements that have occurred within and across partnerships.

Despite a number of limitations, a key strength of this evaluation is the value it adds to the global pool of knowledge on the impact of partnerships in improving patient safety and IPC. In particular, APPS has had a dual emphasis on the "how" as well as the "what" of patient safety improvement, with APPS partners helping to co-develop the multifaceted improvement framework and associated tools and resources that are now available universally. As with many previous evaluations of patient safety and IPC improvements, there are limited data on patient outcomes. However, the results provide valuable information on the likely impact of the programme and indicate that APPS has to some extent – across multiple countries and institutions – fulfilled its objectives, and the measures employed suggest promising impact. This foundation will need to be built on further.

APPS has delivered hospital-to-hospital partnerships that appear to have stimulated improvement and results in terms of their outputs and short-term outcomes. Patient safety systems and processes appear to be stronger in each of the participating hospitals in Africa, and this is highly likely to be due to the activities supported by and stimulated as a result of APPS. The initial aspiration of the programme was to inspire bidirectional improvement and knowledge transfer, and there is evidence that this occurred.

One of the defining features of the APPS approach is that it presents an alternative to traditional "vertical expert-driven" technical assistance improvement models. APPS uses front-line expertise from across both arms of the partnership hospitals and benefits from the commitment of partners to a long-term sustained

engagement based on human interaction and with an understanding of the importance of mutual benefit, shared vision and institution-wide buy-in, as part of a broader national and international movement. Some of the partnership examples described in this report illustrate how front-line passion and energy is driving implementation of patient safety and IPC improvement, which in turn is informing national policy direction.

In addition, APPS provides a very tangible entry point (patient safety and IPC) for broader improvement in service delivery with a focus on front-line realities.

Finally, the APPS approach has received attention during 2014–2015 in the context of the outbreak of Ebola virus disease in West Africa, in part due to its potential to address weak and unsafe health care systems. It is clear that a new vision in which IPC and patient safety, a capable front-line health workforce, just-in-time surveillance and information systems, and an engaged community all contribute to high-quality service delivery.

Based on the findings of the APPS evaluation, the following 10 recommendations are made:

1. In the area of policy, use the evaluation findings to support the emerging drive for national patient safety policy and strategy in the African Region with a focus on implementation-informed policy-making processes.
2. Leverage the benefits to NHS (and European) organizations to explore opportunities for future financial support to further develop APPS.
3. Promote hospital-to-hospital patient safety partnerships as part of the post-Ebola virus disease resilience agenda for strengthening health service delivery, with an immediate focus on reactivation of essential health services.
4. Promote the use of institutional partnerships to co-develop thinking on how to redesign services for people-centred care.
5. Promote the use of institutional health partnerships to design integrated service provision within the context of evolving universal health coverage systems.
6. Utilize hospital-to-hospital partnerships to build capacity to address the global antimicrobial resistance challenge.
7. Build on the collaborative work with POPS to address barriers to affordability, supply and distribution of essential IPC products in Africa.

8. Further develop the partnership model to maximize impact of the approach for multiple subject areas and to work towards global health workforce solidarity.
9. Develop a comprehensive communication and dissemination strategy to ensure findings reach all key actors, including nongovernmental organizations, and encourage publication in peer-reviewed journals to enhance spread of knowledge in this emerging field of enquiry.
10. Build on the community engagement findings to strengthen service delivery with a focus on the post-outbreak Ebola context.

"We were able to move faster towards our goal than we would have on our own"

Dr Emanuel Addo-Yobo
Komfe Anokye Teaching Hospital, Ghana
APPS Partnership Strength Survey, 2012

BACKGROUND

Context

At the political level, the African Partnerships for Patient Safety (APPS) is a response to the ministerial commitment and mandate for patient safety action from all 47 ministries of health in the World Health Organization (WHO) African Region obtained at the 58th session of the WHO Regional Committee for Africa (September 2008) *(3)*. In the same year the Department of Health of the United Kingdom published its five-year strategy, "Health is Global", setting out five areas for action and specifically highlighting access to medicines, technologies and innovations and increased patient safety *(4)*. An initial grant for APPS came from the United Kingdom Department of Health (International Division) with subsequent donor support from the Government of France.

The effective use of institutional health partnerships to strengthen health service delivery has received growing acknowledgement during the lifetime of the programme. The recently published Global Health Strategy of Public Health England *(5)* highlights strengthening United Kingdom partnerships for global health activity as one of its top five strategic priorities. Partnerships are also being actively encouraged because of the benefits they can confer on more developed health systems *(6, 7)*.

Overview of the partnerships involved

During the period 2009–2014, APPS has generated 17 hospital-to-hospital partnerships focused on improving and spreading patient safety across and beyond the African Region. The partnerships comprise 12 European hospitals from three countries (France, Switzerland and the United Kingdom) and 14 hospitals in 17 different countries in the WHO African Region (Benin, Burkina Faso, Burundi, Cameroon, Côte d'Ivoire, Ethiopia, Ghana, Malawi, Mali, Niger, Rwanda, Senegal, Togo, Uganda, United Republic of Tanzania, Zambia and Zimbabwe). Linguistic diversity of the programme is demonstrated through the involvement of English, French and Portuguese speaking countries. Partnerships formally joined the programme in stages or waves, with a first wave established in 2009 and a second in 2011 (Annex 1). In 2013 the programme was opened up to any hospital partnership anywhere in the world (Annex 2). This has resulted in a number of key developments, including the first South–South partnership between hospitals in Zimbabwe and the establishment of a partnership project involving Johns Hopkins University's Armstrong Institute for Patient Safety and Quality and institutions in three African countries – Liberia, South Sudan, and Uganda. At the time of publication there were 99 members of the APPS community network, spanning 39 countries.

This report focuses primarily on evaluation of the second wave of APPS partnerships, with an emphasis on United Kingdom–Africa hospital partnerships. Previous evaluation reports (Annex 3) focusing largely on the first wave of hospital partnerships have been described elsewhere.

INTRODUCTION

This report addresses the impact of hospital-to-hospital patient safety partnerships on patient safety – with a focus on infection prevention and control (IPC) – and service delivery. It fulfils a number of functions. It presents a brief summary of the APPS approach, outlines the evaluation design and highlights the main findings emerging from the evaluation and learning in the relatively short time frame of the programme. The report outlines what has been delivered in terms of impact against objectives and makes a series of recommendations.

Theory of change

The evaluation is based around the APPS theory of change, summarized in Box 1. A comprehensive visualization of the theory of change is presented in Annex 4.

Box 1. APPS theory of change

- Hospital-to-hospital partnerships, centred on local ownership and leadership, add value.
- They have an impact on patient safety over and above conventional approaches.
- The APPS framework of improvement is centred on a suite of improvement tools and resources, co-developed by its first-wave hospital partnerships, and provides a robust mechanism for improvement that is replicable and scalable.
- A regional mandate from ministries of health acts as a powerful lever for change.
- Front-line realities can inform national policy-level action.

The APPS approach to patient safety improvement involves establishing a formal hospital-to-hospital partnership between European and African hospitals, led by senior clinicians on each arm, and with support and endorsement from national ministries of health and other relevant institutions, and from WHO country and regional offices. Each partnership agrees to a minimum two-year participation period, which involves undertaking a baseline assessment of the state of patient safety using a situational analysis tool devised by the programme, identifying gaps, prioritizing actions and implementing a programme designed to address the gaps. The situational analysis is repeated annually, and in parallel the core programme teams on each arm are surveyed twice yearly to gather feedback on their perceptions of the strength of the partnership and, separately, the spread that has occurred beyond the initial African hospital.

An abundance of data has been generated relating to infrastructure, actual improvements to processes of treatment and care that have been implemented, policies written (locally and nationally) and numbers of personnel who have undergone training. To date there are very few data on patient outcomes. This is compounded by limited health information systems and surveillance in African hospitals. For this reason, the programme theory of change addresses impact on outcomes as a long-term aim.

Programme objectives

All programme activity is aligned with the three core programme objectives (Box 2).

The initial intention was to nurture and develop hospitals in each of the partnerships to become amplification points for patient safety improvement through a focus on:

• each partnership developing a cadre of trained patient safety professionals to act as national and in some cases regional resources;
• developing close and effective relationships with government, academia and civil society on patient safety;
• ensuring a two-way exchange of knowledge between African and European partners, with all partners appreciating cultural differences;
• partnership work contributing to national and regional health priorities with a willingness to implement multiple patient safety initiatives; and
• agreeing to undertake impact assessments and demonstrate significant quantifiable improvements in health outcomes.

A key feature of APPS has been its definition of partnership, co-developed with the first wave of partners and informed by a thematic review of the literature at the start of the programme.

This definition has come to be recognized as an exemplary approach at the international global health level (Box 3), being utilized by United Kingdom-based partnership endeavours, for example the Health Partnership Scheme.

Programme structure

The programme is coordinated from within WHO's Department of Service Delivery and Safety with outreach staff in the WHO African Region and the United Kingdom. An initial donor agreement was managed on behalf of the United Kingdom Department of Health, International Division, by the National Patient Safety Agency and subsequently by Imperial College London.

Main partners

APPS has been built on effective collaborations and partnerships with a range of national and international organizations to strengthen its efforts to achieve safer health care across the African Region. Since its inception the programme has collaborated closely with the United Kingdom's leading partnership-focused organization, the Tropical Health Education Trust (THET), and more recently with Ensemble pour une Solidarité Thérapeutique Hospitalière en Réseau (ESTHER). Partners that have played a significant and supportive role in programme development are listed in Table 1.

Table 1. APPS partner organizations	
Armstrong Institute for Patient Safety and Quality	The Armstrong Institute provides an infrastructure and platform that oversees, coordinates and supports patient safety and quality efforts across Johns Hopkins' integrated health care system and started an active collaboration with APPS in 2014, focused on three African countries.
Department of Health (United Kingdom)	The initial funder of APPS, as described in the 2008 donor agreement.
ESTHER	ESTHER is a French organization that supports partnerships between hospitals in France and Francophone Africa to improve and strengthen the provision of care. APPS has collaborated closely with ESTHER since 2011 in relation to three patient safety partnerships, as well as wider strategic collaboration.

Hôpitaux Universitaires de Genève (HUG), Switzerland	HUG has a long-standing history of humanitarian work and together with its pioneering focus on infection prevention and control and hand hygiene improvement, under the leadership of Professor Didier Pittet, was a strong supporter of APPS. The appointment of Professor Pittet as special adviser for APPS reflects this.
International Alliance of Patient Organizations (IAPO)	IAPO is a global alliance representing patients across all disease areas and promoting patient-centred health care around the world. APPS collaborated with IAPO to strengthen the programme, particularly its engagement with communities to spread patient safety knowledge and learning.
Ministry of Health, France	Funder of the second wave of APPS partners (France).
National Patient Safety Agency	The mandated body for patient safety in England at the time of the donor agreement, the National Patient Safety Agency was the logical host organization within the United Kingdom until its abolition in 2011.
THET	The leading partnership-focused organization within the United Kingdom, with a 20-year track record of facilitating partnerships between health institutions in Africa, Asia and elsewhere in the world, THET provided a core source of guidance during programme development and throughout the period of the evaluation.
WHO Regional Office for Africa	The WHO Regional Office for Africa, based in Brazzaville, Congo, provides intense support to the 47 Member States in the region. APPS works closely with colleagues in the region to ensure the programme is effective in stimulating improvements in quality and safety of care. The WHO Regional Office was instrumental in securing a commitment to patient safety.
WHO ePORTUGUESe	The programme supports Portuguese-speaking Member States in the areas of health information and capacity-building of human resources for health. The ePORTUGUESe programme has supported APPS in the development of the partnership between Beira, Mozambique, and Ipswich, United Kingdom.

How this report adds value to global health partnership work

Given the paucity of published literature on patient safety within Africa, and virtually no published data on the role of partnerships in improving patient safety, APPS is in the unique position of demonstrating how programme activities and outputs can contribute to short-term and long-term outcomes that will ultimately have an impact in terms of lives saved, reduced health care costs and safer, better-quality, more effective person-centred service delivery. This is likely to generate interest both at the programme level, for current and future partnerships, and at the level of donors and policy-makers.

The WHO African Region is an environment where patient safety historically has received a low priority *(3)*. The situation has been compounded by an absence of data. Until recently, in many countries patient safety has been absent from national policies and plans. However, during the time frame of the programme, patient safety has undergone a renaissance and is increasingly being seen as a fundamental right within the context of universal health coverage. This is aligned with the forthcoming sustainable development goals, wherein safe, high-quality service delivery will be acknowledged as integral to achieving universal health coverage. The 2014 outbreak of Ebola virus disease in West African countries has further catapulted patient safety and IPC into centre stage, both in terms of the immediate preparedness and response activity and in relation to health system strengthening and resilience in a post-outbreak context.

In summary, partnerships are increasingly being seen as having a key role to play in global health, and WHO has recognized their contribution to universal health coverage, capacity-building, attainment of better health outcomes, fostering of North–South, South–South and triangular cooperation (including the transfer of technologies), preparation for and response to emergencies and disasters to minimize the impact on public health, and the development of sustainable and comprehensive health systems. APPS exists within this context.

"There is no quality without safety, and no safety without quality. Safety is at a virgin state in most of Africa and it is difficult to prioritize patient safety action unless it is explained in terms of how it contributes to systems strengthening."

Dr Jean Bosco Ndihokubwayo
Patient Safety Regional Focal Point
WHO Regional Office for Africa, 2009

THE EVIDENCE

Summary points

- Gathering data on the magnitude of harm and death due to weak patient safety systems is hampered by weak surveillance systems in Africa.
- Available evidence suggests the numbers of patients harmed and killed is substantial across the African Region and that there is inequity with the global North.
- Health care-associated infection is a subset of patient safety and prevention is compromised by lack of access to life-saving technologies such as alcohol-based hand rubs and personal protective equipment.
- Antimicrobial resistance presents a threat to hospitals and the community in the African Region and basic IPC practices can play a role in addressing the threat.
- IPC and patient safety have the potential to act as a bridge, accelerating the interaction of disease-specific programmes and health system strengthening.
- Evidence on the impact of partnerships at the individual and institutional level is expanding and recent findings suggest the following benefits:
    - access to financial and scientific resources (Southern partners);
    - capacity-building for service delivery and research (Southern partners);
    - corporate social responsibility, knowledge and professional development (Northern partners);
    - improved service delivery (Northern partners).

Patient safety in Africa

Data on the magnitude of harm and death in Africa as a direct result of unsafe health care, including data on health care-associated infection, are limited for a number of reasons, including the lack of standardized definitions and systematic data collection and the reliance on self-reporting (8). There is also limited information on the extent of antimicrobial resistance across the region. However, available data indicate that Africa shares the worldwide trend of increasing drug resistance to microbes that can be spread both in hospitals and the community (9).

Emerging evidence suggests that inequitable access to safe, effective treatment affects tens of millions (10). One study estimated that in just 26 hospitals across the African and Eastern Mediterranean Regions over 10 000 people die each year as a result of adverse events, including health care-associated infection. Multiplying this by the estimated 60 000 health facilities in sub-Saharan Africa potentially results in millions of avoidable deaths (11). A recent survey found

that 75% of African health care professionals engaged within the study believed that adverse events were often mistakes made by individual practitioners leading to personal guilt, depression and remorse. This was coupled with over 53% of respondents reporting frequent or occasional episodes of medical error, reinforcing the conclusion that patient safety is a very real problem in the African Region (12).

Data also suggest a disproportionate burden of health care-associated infection in Africa compared to the global North – newborns are at highest risk, with health care-associated infection responsible for 75% of all neonatal deaths (13). In addition, up to half of all patients of all ages admitted for surgery will develop an infection. This is many times higher than published data from the United States and Europe, reinforcing a clear global inequity.

Many of the interventions to ameliorate the problem of patient safety and health care-associated infection are low cost. Hand hygiene

by health care workers for example is a universally relevant intervention that if applied reliably, at the right time, plays a critical role in halting the spread and acquisition of microbes that cause health care-associated infections *(14)*. There is a growing body of evidence that low-cost technologies that facilitate hand hygiene, such as alcohol-based hand rubs implemented as part of a multifaceted improvement approach, can play a crucial role in reducing the likelihood of health care-associated infection and thus save millions of lives at the global level *(15, 16)*. There is also an economic case for investing in hand hygiene improvement strategies, with some estimates suggesting that even a reduction of just 0.1% in the rates of health care-associated infection is highly likely to be cost saving over a five-year period *(14, 17)*.

The vast majority of government hospitals in sub-Saharan Africa have limited, erratic or no water supplies and no access to alcohol-based hand rubs. A recent survey by WHO examined the volume sales of alcohol-based hand rubs by leading global commercial companies across Africa in 2011, and found that the total litre sales to the health care sector would fill only one fiftieth or 2% of an Olympic-sized swimming pool *(18)*. Furthermore, the alcohol-based hand rubs that are commercially available in sub-Saharan Africa tend to be used in private hospitals, thus resulting in an in-country inequity.

Lack of access to these low-cost technologies is compounded by logistical barriers, weaknesses in transportation, the economic infrastructure, access to raw materials, and a lack of awareness of the impact of the interventions on patient outcome and population health. As far back as 2005, WHO's first Global Patient Safety Challenge, Clean Care is Safer Care,[3] advocated national political commitment and action to address the problem and promoted hand hygiene and alcohol-based hand rubs as an entry point to better patient outcomes. One output of the work was a formula for local production of alcohol-based hand rubs that has been tested and found to be affordable and achievable in a range of low-income settings, including a hospital in West Africa *(13)*. The response to the call to action was phenomenal in all parts of the world, with the exception of sub-Saharan Africa.[4]

Recent discussions have focused on the interaction between health systems and disease-specific programmes, and the challenge of ensuring such programmes do not overburden already fragile health systems, while at the same time acknowledging that weak health systems prevent progress in meeting disease-specific targets *(19)*. Of relevance to this evaluation is the growing consensus that IPC and patient and health worker safety epitomizes the intersection between disease-specific programmes and health systems and could play a role in strengthening the interaction at the health facility level *(20)*. In essence, IPC is described as being most effective at the hospital and health centre level only if all the accepted building block components of a health system are functioning well.

"For health care workers in different disciplines in a busy district hospital or health centre to gather around the table on a Monday morning requires a topic of mutual interest, importance and relevance. Infection control and health facility safety fulfil these criteria, both for the health care worker fraternity and the constituency of patients who utilize the facility. Infection control fills the void, and provides relevant issues for discussion that require local leadership, a sound understanding of disease epidemiology, clarity of thought, community inputs and a pragmatic approach to finding solutions."

Source: Harries et al. *(19)*.

In the last two years a concerted effort to place patient safety and prevention of health care-associated infection on the policy agenda across the African Region has gathered momentum, influenced most recently by the Ebola virus disease outbreak and the scrutiny this has placed on health system resilience in the affected and at-risk countries (and beyond). It is anticipated that all ministries of health will be recommended to accelerate action in this area, including the development of national policies, over the next two years.

Patient safety partnerships
Evidence on the impact of health partnerships themselves on patient safety is severely limited and could be described as an underresearched

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[3] Clean Care is Safer Care. World Health Organization website: http://www.who.int/gpsc/en/.

[4] Make Africa Orange. Infection Control Africa Network website: http://www.icanetwork.co.za/projects/make-africa-orange/.

field, making this evaluation of potential relevance to public and health policy. There is some evidence already in the public domain from the APPS programme that a partnership approach can stimulate action on patient safety and IPC *(21)*.

Previous evaluations of partnerships have largely focused on more general benefits, particularly to developing countries. These can be summarized as resulting in greater access to financial and scientific resources and capacity-building for health care delivery and research *(22)*. A recent study analysed the type and nature of benefits to the United Kingdom, including an analysis of cost. The review found evidence of 10 benefits to institutions, and 10 national benefits, including corporate social responsibility and enhanced understanding of the global context, and suggested that taking into account all limitations, the benefits of health partnerships outweigh the costs.

ESSENTIAL FEATURES
OF THE **APPS** PROGRAMME

Programme development was informed by a preliminary assessment undertaken with the WHO Regional Office for Africa and ministries of health *(23)*. This assessment acted as a regional needs assessment to ensure that programme interventions and approaches were grounded in front-line reality. The assessment was framed around the 12 action areas first described within the technical report of the 58th session of the WHO Regional Committee for Africa (Box 4). This enabled the programme to identify and respond to the needs of the region in both the design of the project and its evaluation.

1. Patient safety and health services and systems development
2. National patient safety policy
3. Knowledge and learning in patient safety
4. Patient safety awareness raising
5. Health care-associated infections
6. Health worker protection
7. Health care waste management
8. Safe surgical care
9. Medication safety
10. Patient safety partnerships (patients, family, health workers and policy-makers)
11. Patient safety funding
12. Patient safety surveillance and research

Programme initiation involved a sequence of activities at the national and local level across Africa and Europe (Annex 5). At the national level a period of advocacy and exploration took place to secure ministerial and WHO country office support for the proposed in-country partnership hospital in Africa. This included technical cooperation visits to hospital sites to support completion of patient safety assessments, with the results being used by national ministries

of health in selecting their focal hospital. In the United Kingdom a similar process was undertaken, working with THET and the National Patient Safety Agency to consider a shortlist of hospitals with pre-existing health partnerships and robust safety and IPC approaches interested in joining APPS. Working with THET enabled the programme to progress more rapidly by building on established hospital-to-hospital partnerships. Interested parties were invited to demonstrate a commitment to strengthen or integrate patient safety within the existing partnership work. In most cases this resulted in a shift in emphasis and a change in the dynamic of partnerships, many of which historically had focused on a single health issue and involved a narrow range of actors on each arm. In Switzerland the approach differed in that HUG, with its long-standing partnership work with three countries in Africa, agreed directly with WHO to support the programme. All partnerships agreed to focus on IPC (action area 5) in line with the WHO regional mandate and to address other challenges informed by baseline assessments. The 12 action areas formed the basis of all partnership activity, including the approach to evaluation.

Once agreement on the partnership institutions was secured at the national level within each country a sequence of activities occurred (Figure 1). Each partnership worked through the APPS six-step improvement approach *(24)*.

Figure 1. Essential features of the APPS programme

Sequence of activities

1. Partners agree to an initial two-year period of implementation, focused on the APPS six-step approach. Each partnership identified a senior leader and secured institutional buy-in

2. Partners participated in an APPS launch event that brought together all partnerships, the APPS team, WHO Regional Office representatives and PFOs

3. Regular telephone communication was established and partnership visits facilitated

4. Partners joined an online web platform

5. Following completion of step six, the plans were reviewed and revised and cycle of implementation continued

6. At the end of year two, partners participated in an APPS learning s ymposium that brought together all partnerships, the APPS team, WHO Regional Office representatives and PFOs

The APPS Six-Step Improvement Approach

Step 1: Partnership Development

Step 2: Needs Assessment

Step 3: Gap Analysis

Step 4: Action Planning

Step 5: Action

Step 6: Evaluation and Review

It is during step 2 of the six-step approach that essential data are collected to facilitate the identification of gaps in patient safety (step 3) and enable a comprehensive action plan to be developed (step 4). The patient safety situational analysis (PSSA) and hand hygiene self-assessment framework (HHSAF) are critical tools in this regard *(25, 26)*.

METHODS

Design of the evaluation

Implementation and evaluation of quality improvement initiatives in a developing country context is complex, as both involve socio-adaptive strategies, with culture and context exerting a significant influence on programme effectiveness and impact *(27)*. This tends to steer evaluation away from classic medical evaluation design such as randomized trials and towards a blend of qualitative with some quantitative methods.

In order to address this complexity, and influenced by the absence of an appropriate pre-existing framework to evaluate such an approach, the APPS evaluation was developmental in nature, employing a mixed methods approach informed by the APPS theory of change. Evaluation centres on the critical question: can the establishment of hospital-to-hospital patient safety partnerships between Europe and Africa (the main independent variable) contribute to a change (improvement) in the safety of hospitals in Africa (dependent variable) and therefore ultimately make it more likely that health care will be safer, patient safety errors reduced, lives saved and costs contained?

Evaluation takes place within its local context with a focus on how each partnership progressed in relation to the three programme objectives. The evaluation sought to answer whether each component of the programme had the capacity to effect change across each of the programme objectives. The evaluation also focused on the operationalization of the APPS approach and its impact. The evaluation therefore examined a number of key indicators related to patient safety improvement, partnership strength and patient safety spread to track short-term impact. A longer-term goal is to consider the impact of patient safety partnerships on health outcomes, that is, medical errors and health care-associated infection. The focus therefore was on experiential and implementation learning to address the questions summarized in Table 2.

Table 2. Six questions the APPS evaluation seeks to answer

Core questions the evaluation seeks to address

1. What impact does the APPS approach and related tools have on patient safety improvement?
2. How does the strength of partnerships influence change?
3. How does the APPS approach impact spread?

Supplementary questions the evaluation seeks to address

4. What are the barriers and opportunities relating to implementation?
5. Do benefits flow back to the NHS?
6. Is reverse innovation a by-product of the programme?

Methodology

The methodology was a prospective programme evaluation, informed by these key evaluation questions. An evaluation framework and set of data collection tools were developed in a participatory manner in which stakeholders were involved in developing the framework and tools. The participatory mechanisms in co-developing the framework are described in detail elsewhere *(28)*. This ensured that evaluation addressed key programme objectives, operations and outcomes and stakeholder concerns and values. The approach is summarized in Table 3.

Table 3. The evaluation sequence	
Evaluation activity	**Data analysis**
1. Partners undertake a PSSA with input of APPS programme lead (Africa)	Review and analysis of PSSA data by programme team and partners
2. In parallel, partners undertake a HHSAF	Review and analysis of HHSAF by partners and programme team
3. At time intervals, a semistructured interview of partners takes place to assess partnership strength and patient safety spread	Review by programme team
4. Partnerships also deliver self-reports and participate in monthly check-in multiway partnership teleconferences to review and discuss progress against local partnership plans	Review by programme team and partners; partnership monthly (telephone) meeting notes
5. Structured group feedback on barriers and opportunities for improvement, benefit flow-back to NHS and reverse innovation (final learning symposium)	Review by programme team

The PSSA was one of three APPS tools co-developed with the first wave of partners, together with the APPS six-step improvement approach and resource map *(29)* to inform improvement and assist with implementation and _sustainability. The HHSAF is a tool with which to obtain a situation analysis of hand hygiene promotion and practices within an individual health care facility, according to a set of indicators. It acts as a diagnostic tool, identifying key issues requiring attention and improvement. Repeated use of the framework enables documentation of progress with time. It is structured around the five components of the WHO multimodal improvement strategy, each section yielding a score that when combined indicates the position a hospital occupies along a continuum of improvement from "inadequate" through to "advanced/embedding".

The HHSAF is a validated WHO tool. The PSSA, partnership strength and patient safety spread surveys have face validity, their strength resting in the participatory approach to development.

In addition monthly, facilitated telephone calls between partnership teams were established for the duration of involvement in the programme.

To supplement the approach described, the final stage of evaluation involved utilizing a learning symposium (which took place in Harare, Zimbabwe) to gather qualitative information from the partners themselves. The aim of the Harare learning symposium was twofold. First, the symposium sought partner agreement that the conclusions that were being made through the formal evaluation are justified so that the evaluation results can be used with confidence. Second, it sought to harvest granular case study information that would provide further detail to overall programme evaluation.

A chronological schematic illustrating programme evaluation is presented in Figure 2.

Figure 2. Chronology of evaluation

PSSA	PSSA	PSSA	PSSA	
+	+	+	+	
HHSAF	HHSAF	HHSAF	HHSAF	Learning Symposium (face to face) exporatory evaluation
+	+	+	+	
PS	PS	PS	PS	
+	+	+	+	
PSS	PSS	PSS	PSS	

Baseline	→ Time	Repeat	→ Time	Repeat	→ Time	Repeat	→ Time	Conclusion
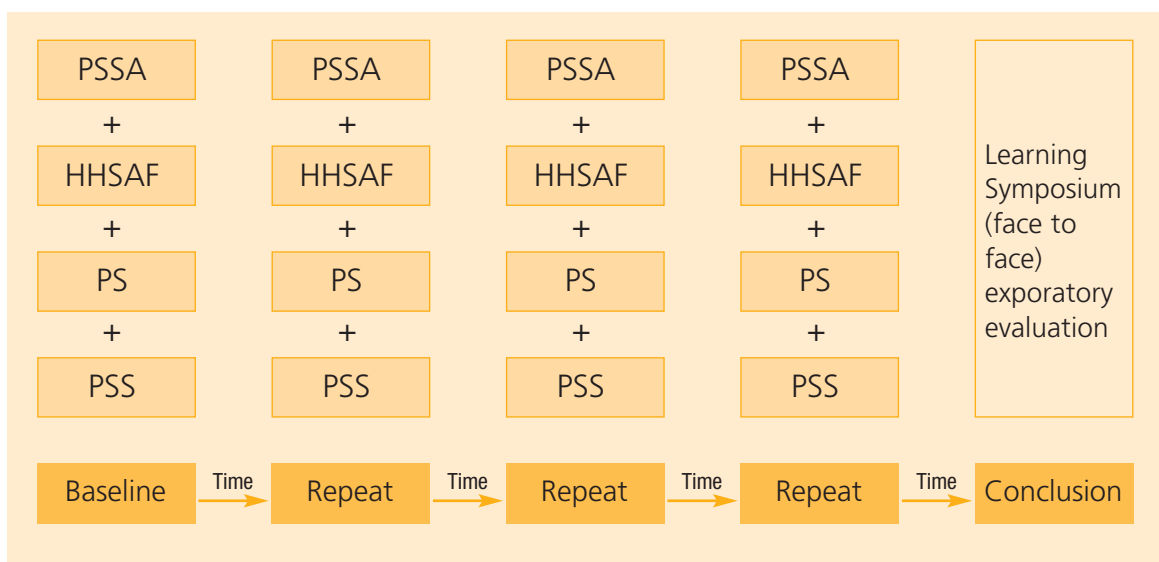
Key: PSSA = patient safety situational analysis; HHSAF = hand hygiene self-assessment framework; PS = partnership strength; PSS = patient safety spread.

Following baseline assessment, each partnership implemented a range of activities under the direction of their local partnership plan, and repeat assessments took place during the two-year period. The APPS evaluation framework *(30)* outlined a requirement for an annual PSSA and HHSAF and biannual partnership strength and patient safety spread interviews. In reality there was considerable variation in the frequency and timing of the evaluation assessments. This was influenced by operational realities, competing priorities and on-the-ground constraints. By the final repeat assessment the evaluation would demonstrate the extent (or not) of the changes that had taken place against each of the indicators and information sources. A null hypothesis would be that the patient safety partnership approach had no observable impact on any of the evaluation indicators. The data sources used in the evaluation are summarized in Table 4.

Table 4. Data sources and indicators/information

What is being measured	Data sources	Indicators/information
APPS programme	Partnership plans and reports, including: Summary and action notes from monthly partnership teleconferences	Programme capacity to deliver outputs
	Summary and action notes from monthly partnership teleconferences	Achievements, barriers and challenges, progress against partnership plans
Patient safety improvement	Patient safety situational analysis	Patient safety infrastructures, policies and processes Participation rates in e.g. training (hand hygiene, safe surgery) Behaviour change
	HHSAF Harare learning symposium	Infrastructure Training Monitoring systems Advocacy Culture
	Summary and action notes from monthly partnership teleconferences	Achievements, barriers and challenges, progress against partnership plans
Partnership strength	Partnership strength survey Harare learning symposium	Ten domains relating to the principles of partnership (Likert-like scale)
Patient safety spread	Patient safety spread survey Harare learning symposium	Ten measures of spread (yes/no)
Barriers to implementation	Summary and action notes from monthly partnership teleconferences	Real-time partner perceptions of barriers and challenges
	Harare learning symposium	Percentage of attendees agreeing on key barriers Case studies relating to local experience
Opportunities for improvement	Harare learning symposium	Percentage of attendees agreeing on key opportunities Case studies on local experience
Benefit flow-back to NHS	Harare learning symposium	Percentage of attendees agreeing on benefits Case studies on local experience
Reverse innovation	Harare learning symposium	Percentage of attendees agreeing on reverse innovation Case studies on local experience

These sources with their multiple indicators and related information would provide some evidence of the programme's effects and impact over the period of implementation. The data gathered are a combination of primary and secondary data. The intention was to synthesize and translate qualitative information collected from across all data sources into a series of case study vignettes.

"This project is focused on using an improvement framework to enable the partnership to develop sustainable improvement in hand hygiene and general aspects of IPC – based on an effective needs assessment derived from the PSSA completed by APPS partners. Project resources will be used to measure success and disseminate good practice both regionally and nationally."

Beira Central Hospital-Ipswich Hospital Partnership
End of Partnership Report 2013

MAIN FINDINGS

The findings are presented according to the six questions that the APPS evaluation sought to address. Interspersed throughout the findings are 25 case study vignettes.

Question 1: What impact does the APPS approach and related tools have on patient safety improvement?

Patient safety situational analysis (PSSA)

The results of the PSSA provide data on the impact of APPS on patient safety improvement at the local level, including the impact on service delivery. All second-wave partnerships completed a baseline PSSA, the results of which were used to identify gaps and develop targeted improvement interventions within a common-template partnership plan, as directed within the APPS preparation package *(24)*. Informed by the lessons learned during the first wave, the partners focused their action plans on between three and five main areas that resulted in diversity of focus and approaches across the five partnerships (Annex 6).

A comparative assessment of the PSSAs highlighted a wide range of gaps across all partnerships at baseline, across all action areas. Table 5 summarizes the gaps by action area.

Table 5. Key gaps identified at baseline	
Action area	**Gaps identified**
Patient safety and health services and systems development	Limited work to determine organizational patient safety culture
National patient safety policy	Limited national regulation of patient safety Limited or no mechanisms to feed into national patient safety policy
Knowledge and learning in patient safety	Absence of or rudimentary systems for recording adverse events
Patient safety awareness raising	Limited community-focused awareness raising Limited action on patients' rights
Health care-associated infections	Absence of surveillance data on health care-associated infection Limited IPC capacity in terms of structures and processes Limited policies and guidelines on antimicrobial resistance and surgical prophylaxis
Health worker protection	Absence of vaccination programmes (hepatitis B)
Health care waste management	Limited segregation processes Inadequate structures for waste management
Safe surgical care	Limited mechanisms for recording complications post-surgery Limited implementation of checklist
Medication safety	Limited policies Limited reporting mechanisms following adverse drug events
Patient safety partnerships	Absence of patient or community engagement
Patient safety funding	Absence of funding for patient safety activity
Patient safety surveillance and research	Absence of research and evaluation on patient safety

Analysis of the gaps at the partnership level stimulated the development of the hospital partnership plan. All partnerships completed at least one repeat analysis. Based on the repeat analyses five broad areas emerge revealing progress and ongoing challenges. These are highlighted in Box 5.

Box 5. Highlights of the PSSA

100% of second-wave partner hospitals in Africa completed the baseline PSSA and at least one repeat PSSA during the two-year period of evaluation. Based on this information the following can be learned:
• Four out of the five partnerships reported a pattern of improvement in patient safety and health services and systems development.
• Limited progress was made across all partnerships in the area of national patient safety policy, knowledge and learning in patient safety, patient safety partnerships, patient safety funding and patient safety surveillance and research.
• Three out of five demonstrated a trend of improvement in patient safety awareness raising.
• Progress across two partnerships was made in implementing antibiotic policies.
• A universal trend of improvement in IPC implementation was noted by all partnerships with the establishment of policies and protocols, structures and systems, including training.

In addition to analysing data from the patient safety spread, supplementary information on patient safety improvement was gathered via analysis of routine partnership reports and monthly partnership exchange teleconference meetings, together with the outputs of the Harare learning symposium. These pooled data sources yielded information concerning progress and ongoing challenges (Table 6).

Table 6. Improvements and challenges in patient safety over the evaluation period

Action area	Improvements and challenges
Patient safety and health services and systems development	Catalytic effect seen in role of patient safety in improving service delivery Limited progress to address organizational patient safety culture through validated instruments
National patient safety policy	Progress on development of patient safety-related policies; untapped potential for patient safety improvement efforts to influence national policy
Knowledge and learning in patient safety	Progress on the adoption of multidisciplinary reviews of events leading to in-patient mortality Progress in implementation of clinical audit
Patient safety awareness raising	Progress on general awareness raising and advocacy Some progress on community-focused awareness raising
Health care-associated infections	Progress on IPC capacity, including addressing infrastructure constraints relating to hand hygiene improvement, awareness raising, training and audit and feedback Establishment of surveillance systems for tracking health care-associated infection Establishment of antimicrobial prescribing and management protocols Limited progress on laboratory capacity-building
Health worker protection	Some progress on addressing structures and processes for vaccination programmes
Health care waste management	Progress to address structures and processes to support waste management, including segregation systems
Safe surgical care	Progress on use of checklists and feedback mechanisms to support surgical safety improvement Development of surgical site infection surveillance systems

Medication safety	Progress on the development of reporting systems for adverse drug reactions and medication errors
Patient safety partnerships	Some progress on patient and community engagement
Patient safety funding	Some progress on securing funding for patient safety activity
Patient safety surveillance and research	Progress on research and evaluation on patient safety

Formal feedback from partners indicated that the PSSA tool and the suite of APPS resources acted as a focus for all partnership activities, clarifying the technical areas on which to take implementation action and providing a systematic approach.

Qualitative information on patient safety improvement from the partners is presented in the following 10 case study vignettes (CSV).

Action area 5: Health care-associated infection

CSV 1: Focused action on health care-associated infection, University Teaching Hospital of Butare, Rwanda

Key points:

The power of the PSSA: The PSSA stimulated a number of activities related to the prevention of health care-associated infection. The APPS partners have collaborated on the development of a tool for monitoring surgical site infections focused on caesarean section and a research project designed to address health care-associated infection in the neonatology department at the University Teaching Hospital of Butare.

IPC as a foundation for tackling antimicrobial resistance: Increased awareness of health care-associated infection and the focus on bacterial infection has enabled a broader focus on antimicrobial resistance and the need to seek out multidisciplinary approaches to optimize use of antibiotics.

Co-development and innovation flow: Co-development of caesarean section surveillance to meet the needs on both arms of the partnership. Both partners interested in a "bundle" approach. Obstetric surgical site infection surveillance has acted as an entry point for broader work on surgical site infection surveillance at Butare, and for mHealth surveillance at Imperial College London, including the development of electronic data, building on the Rwandan and Imperial (and Malawi) experience. This is helping broader work on the potential power of mHealth.

The improvement–spread interface: Supported by the APPS activity, a two-year partnership with THET (Partnerships for Global Health) commenced in 2013 with the aim of reducing neonatal mortality and maternal and paediatric infection. The partners consider the THET–APPS partnership has evolved into an interconnected, mutually beneficial relationship.

CSV 2: Leveraging IPC as the entrance door to patient safety, Mbeya, United Republic of Tanzania

Key points:

Building on existing quality structures: Implementation of APPS activities has been facilitated by the strong grounding in IPC at Mbeya Hospital and the experience and commitment of the IPC coordinator. A well-established IPC committee resulted in the existing team being well positioned to incorporate APPS activities within their work. Significant strides have been made in developing a surveillance system to record health care-associated infection. The improvement teams are also well grounded in the principles of quality improvement through involvement in Kaizen 5S foundational work. The blending of the Kaizen 5S and APPS approaches has been particularly helpful.

CSV 3: Developing policies and pathways, Ndola, Zambia

Key points:

Strengthening IPC and surveillance: A programme of audit and baseline epidemiology to establish current levels for key infections is under way, with hand hygiene audits being established. Admission and discharge diagnosis data are being collected to review risks of contagious disease, and to allow development of policies around patient pathways and appropriate isolation policies.

Action area 6: Health worker protection

CSV 4: Addressing health worker safety, Ndola, Zambia

Key points:

The power of the PSSA: By focusing on the gaps in health care worker safety, efforts have included advocacy of immunization of all health workers against hepatitis B; exploring what infection screening is currently undertaken; setting up a hepatitis B vaccination programme for staff; and clarifying the link regarding the provision of information between the staff clinic and human resources for new staff. A hepatitis B vaccination policy is being developed together with a health and safety training package, using the train-the-trainer model.

Flow of learning: The partnership connected with one of the first-wave APPS partners with a track record in this area, as well as seeking input from WHO experts on hepatitis B prevention programmes in Africa. The work is at an early stage but the focus is on reviewing the management of staff body fluid exposures, including measures for hepatitis B prophylaxis and hepatitis C prevention; reviewing current preventive strategies and good practice guidance and measures in place for post-exposure risk assessment and use of post-exposure prophylaxis; and considering data recording of staff exposures with a view to establishing reporting mechanisms.

Action area 8: Safe surgical care

CSV 5: Focused action on safe surgery, Butare, Rwanda

Key points:

The power of the PSSA: The PSSA stimulated a number of activities related to safe surgery. The checklist is now integrated within obstetric notes. Part of this work has involved mass (targeted) training across neonatal and paediatric units, including 50 senior doctors and nurses, with 30 trained to provide future training. This has also expanded to staff from districts beyond the University Teaching Hospital of Butare.

CSV 6: Stimulating use of the surgical checklist, Beira, Mozambique

Key points:

The power of the PSSA: The use of the checklist was confirmed but considerable cultural resistance was highlighted in both partnership hospitals.

Flow of learning: The experience of the Ipswich team in improving compliance through regular audits and education was used as the model for Beira.

The importance of adaptation for adoption: The checklist was adapted to meet the requirements of local teams in Beira prior to adoption in all theatres. Communication with medical staff through regular formal meetings helped to empower them and facilitated adaptation, encouraging local ownership.

CSV 7: Training, workflow, and patient identification, Komfo Anokye Teaching Hospital, Kumasi, Ghana

Key points:

A multimodal, context-specific approach: At the Komfo Anokye Teaching Hospital all surgeons and all theatre staff were trained on the use of the surgical safety checklist. Training and guidance were also provided on safe staffing levels in theatres and staff skills mix. In addition, theatre staff were trained to look at theatre list planning techniques to increase the efficiency of theatres. The use of identity name bands was rolled out to all areas with follow-up audits to assess consistency in use.

The importance of adaptation for adoption and spread: Agreement to adapt the checklist and introduce in radiology, eye and dental departments. Pre-op checklists on the wards were introduced, including the use of marker pens (dependent on supplies).

CSV 8: Implementation of the surgical checklist, Ndola, Zambia

Key points:

The power of the PSSA: APPS catalysed policy change such that all operating theatres and surgical specialties at Ndola Central Hospital now implement the checklist. This is underpinned through the development of medical and nursing leaders and individual nursing champions in the relevant operating areas, whose roles have been to introduce, continuously promote and undertake the checklists. An audit in 2013 showed that the checklist was used in 68% of surgical cases. Audit is now ongoing.

The improvement–spread interface: In conjunction with the introduction of the checklist, Ndola staff have also identified, developed and introduced other aspects of safe surgical care, including procurement of four pulse oximeters for use in the operating theatres, a key component of the surgical safety checklist; development of a surveillance programme for surgical site infections and data collection; development of a data collection system for surgical mortality rates; introduction of an improved consent form and gradual change in process, shifting consent taking from nursing staff to the surgeons; and the development of a hospital critical incident committee, which reviews all critical incidents and any lessons to be learned from them.

Action area 10: Patient safety partnerships

CSV 9: Strengthening advocacy, Butare, Rwanda

Key points:

Patient safety partnerships as a vehicle for advocacy: Awareness of the concept of patient safety and infection prevention in clinical care and at the management level has expanded as a direct result of participation in APPS, considered to be a significant achievement by the partners. The organizational structure at the University Teaching Hospital of Butare now reflects this.

Action area 12: Patient safety surveillance and research

CSV 10: Enhancing data collection and feedback, Komfo Anokye Teaching Hospital–St George's Hospital

Key points:

Co-development and innovation flow: To address the existing time-consuming data collection systems, analysis systems were co-developed to enable real-time knowledge of how well implemented the improvement systems are in the clinical workplace. The team from Komfo Anokye Teaching Hospital opted to use a system developed at St George's, which uses tablets uploaded with a simple system to set up bespoke audits for the three areas prioritized through the PSSA. This has enabled data to be entered directly in the clinical areas; data are uploaded via Wi-Fi connections to an intranet-based database and automatic analysis of data is undertaken using a predefined graphical format. The data can also be exported to Excel for further analysis if required. The experience at Komfo Anokye Teaching Hospital has also informed patient safety improvement efforts at St George's Hospital through refined approaches to data collection systems.

Hand hygiene self-assessment framework (HHSAF)

Completion of the HHSAF was conducted in all five second-wave partnership hospitals. Recompletion of the assessment was non-uniform across the partnerships. The HHSAF allowed partners to track progress over time in relation to each of the five components of the multimodal strategy. The final average score enabled health facilities to determine their position on a continuum of improvement from inadequate through to leadership levels. Of partner hospitals in Africa, 100% completed the baseline HHSAF. Two of the five undertook annual repeat assessments, two did no repeat and one undertook a single repeat. Results from three of the partnerships are presented in Figure 3.

Figure 3. HHSAF results visualization
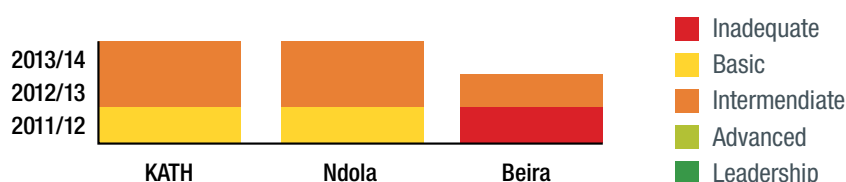
Key: KATH = Komfo Anokye Teaching Hospital.

The trend of improvement in the partner hospitals is likely to be influenced by three factors. The first concerned system change and capacity-building – all five partnerships (African Region) underwent training in local production of alcohol-based hand rubs *(31)*. This was supported through collaboration between APPS and WHO Private Organizations for Patient Safety (POPS).[5] Second, there was a marked increase in training on hand hygiene per se over the two-year period – all partnerships addressed training in IPC and hand hygiene specifically within their partnership plan. Third, all partners implemented audit and feedback mechanisms. Additional information on hand hygiene work can be gleaned within CSV 11–16.

CSV 11: Advocacy and awareness raising, Beira, Mozambique

Key points:

Triggered by the HHSAF, the partnership successfully raised the awareness of the importance of hand hygiene throughout the hospital and the wider community via training sessions in local schools. Effective hand hygiene facilities have been established in the critical care unit and emergency assessment ward.

CSV 12: Targeting action on training, Butare, Rwanda

Key points:

A multifaceted approach to address identified gaps has resulted in targeted action on training and audit. Fifty trainers have been trained on hand hygiene improvement. Thirteen participants came from 13 of the surrounding local district hospitals. This has generated training of 122 medical staff, nurses, midwives and cleaning staff. To complement this, an audit programme has been established.

CSV 13: The importance of leadership, Komfo Anokye Teaching Hospital, Ghana

Key points:

The provision of a dedicated deputy director of nursing in charge of IPC, who works in the quality assurance team, enabled strong leadership for hand hygiene and wide understanding of the importance of this issue within the organization. The deputy director of nursing is highly visible in clinical areas.

CSV 14: Targeted placement of alcohol-based hand rubs, Ndola, Zambia

Key points:

A blend of cascade training, promotions, audit and feedback, and system change has supported sustainability – 41 hand hygiene champions were introduced, 50% of staff trained and the WHO posters on hand hygiene displayed in most wards and treatment areas. Sixty alcohol-based hand rub dispensers were placed in strategic areas. Observational hand hygiene audits were introduced. The WHO HHSAF has provided a powerful way of visualizing the improvement.

CSV 15: National support, local action, Mbeya–North Cumbria

Key points:

Strong leadership has been a cornerstone of the partnership. Partnership work has been supported by and aligned with national action on IPC and an embedded Kaizen 5S framework. In the face of multiple challenges the partnership emphasized that APPS has presented an opportunity for the sharing of ideas, innovations and challenges, with an emphasis on mutual discussion and resolution.

Availability of IPC and hand hygiene policies and guidelines was an early focus coupled with the development of monitoring and supervision systems, which acted as a solid foundation.

To date 95% of staff have been trained on hand hygiene through a blend of practical and ward-based sessions and dedicated training events. Improvements to infrastructure have resulted in a high-profile, high-visibility approach to hand hygiene, supported by routine audit of usage. Visitors are encouraged to participate in hand hygiene improvement and there is some evidence of spread to the local community supported by mass awareness-raising campaigns.

[5] Private Organizations for Patient Safety (POPS). World Health Organization website: http://www.who.int/gpsc/pops/en/.

Key points:

A capacity-building train-the-trainer workshop on the local production of WHO formulation alcohol-based hand rubs was held in Harare, Zimbabwe, in March 2013. This training event was the first of its kind. Two pharmacists from each of the second-wave African hospitals were trained by first-wave partners with a track record of success in local production. A train-the-trainer model was employed.

Capacity-building through training however is only one part of the solution. Significant challenges were identified in sourcing the appropriate hardware, particularly plastic bottles, to ensure the alcohol-based hand rubs could be made available at the right locations to facilitate use and assist with behaviour change of health care workers. In addition, local production offers a short-term solution to the problem of lack of access to alcohol-based hand rubs across the African Region. A sustainable and equitable approach would see a commercially available product at an affordable price. However, multiple barriers prevent this becoming a reality at the present time.

To address the short-term barriers related to availability of bottles, a collaboration between APPS and POPS resulted in a one-off donation of empty bottles (the POPS-APPS Bottle Bank Project) to each of the hospitals participating in the train-the-trainer workshop. This project yielded key information on the barriers related to transportation and access. In parallel, work with POPS is continuing to identify all of the barriers in the supply chain that prevent access to this life-saving technology across the region.

Question 2: How does the strength of partnerships influence change?

The evaluation aimed to establish the main drivers of change in each of the partnerships, and in particular the role of partnerships in stimulating change. The initial aim of the partnership strength survey was a six-monthly cycle of face-to-face or telephone surveys. This did not occur across all partnerships due to logistical challenges associated with coordinating the interviews. Box 6 presents three highlights from the survey results.

Box 6. Highlights of the partnership strength survey

100% of partnerships participated in the baseline partnership strength survey. The partnership strength survey was repeated a further two times by two partnerships and once by the remaining three. Based on this information the following can be learned:

• The perceived strength of the partnership was strong at baseline, united around a shared vision, respect and decision-making, and this was maintained throughout the two-year period.

• Communication and sharing of information was perceived to improve from baseline by the final survey on both arms.

• Institutional ownership and stakeholder engagement was felt to be stronger by the final survey.

The evaluation framework initially envisaged separate interviews for each arm of the partnership. In a number of partnerships the partners themselves dictated that the interviews be undertaken jointly, with both arms present – usually associated with partnership visits. Figure 4 illustrates the survey findings.

Baseline responses were positive around most parameters with consensus agreement in relation to a shared vision, shared decision-making, institutional ownership and respect for cultural norms. This was maintained across the course of the surveys. There was an increase in agreement over time in relation to sharing of information and effectiveness of partnership communication, particularly noticeable on the United Kingdom side of the partnership. Again, a pattern of increasing agreement was observed around stakeholder engagement and institutional ownership.

Figure 4

1. Our partnership shares a common vision

2. We always have up to date information about our partners activities

3. Key decisions are made jointly between both sides of the partnership

4. Communication between the two sides of the partnership is effective

5. Partnership activities are owned by the institution, not just by an individaul

6. All stakeholders are engaged and involved

7. Partners respect one another and understand one another's local rules, culture and customs

8. Our partnership working makes effective use of the particular skills that individuals within the partnership

7. Partners respect one another and understand one another's local rules, culture and customs

Legend:
- Strongly agree
- Agree
- Disagree
- Strongly disagree
- Not applicable

The survey results indicate a maturation of the partnerships over the two-year period, with evidence on both sides and in multiple domains of a stronger partnership in 2014 than existed in 2012.

Question 10 of the survey asked the partners to describe the three key benefits of partnership working. Some of the key perspectives shared by partners are summarized in Figure 5. There is a consensus across each of the surveys and on both arms of the partnership concerning the potential benefits, and how these were realized over time.

Figure 5. Key benefits of the partnership approach

UK partners	SURVEY 1	African partners
Development of innovation in training; Working with and learning about other cultures; Learning different ways of doing things.		Fast track on "how" to address challenges (structures, strategies, processes); Helps prioritization; Visits support implementation - help focus on who to empower to secure commitment; "Peer review of our service from the outside".

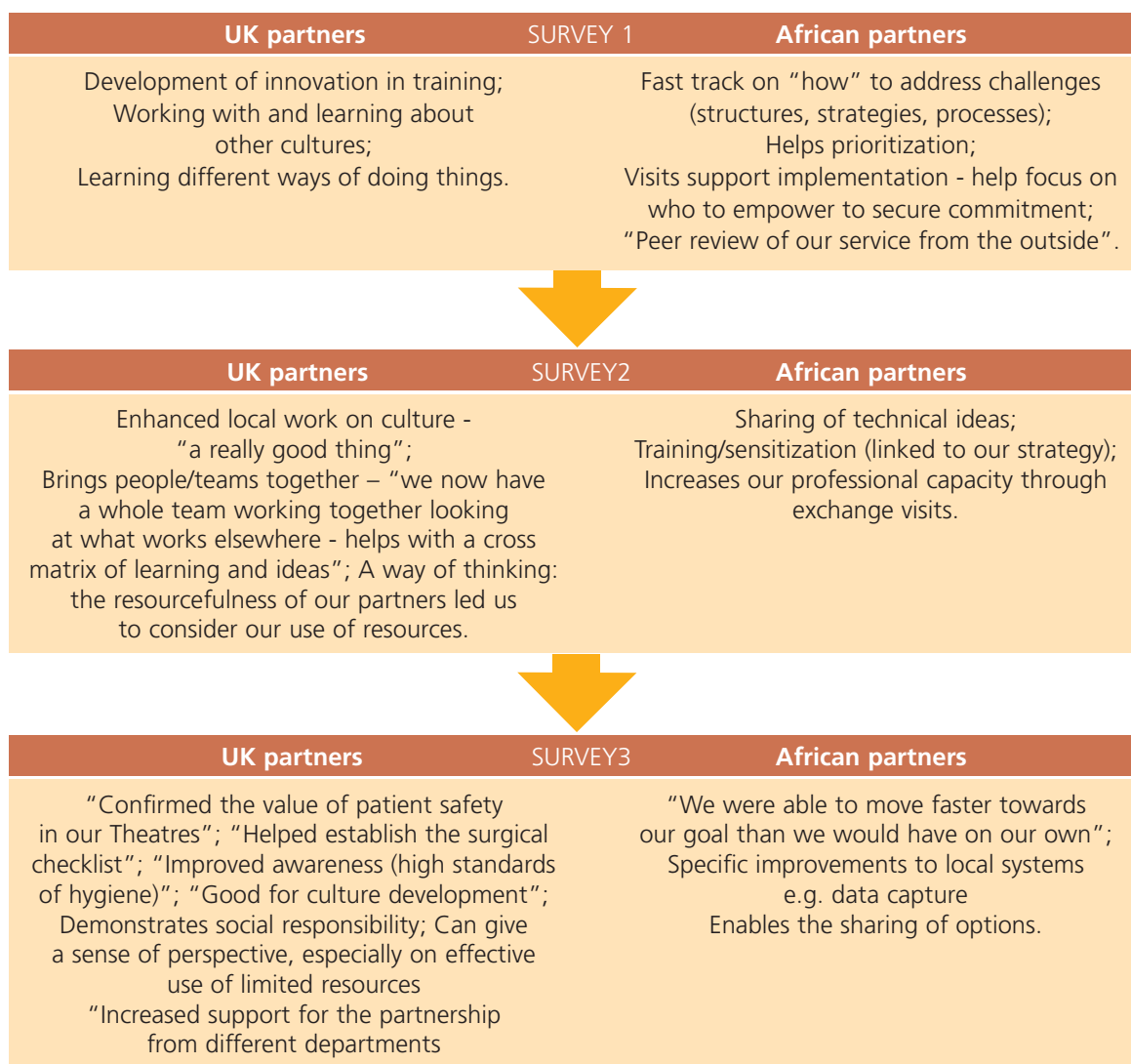| UK partners	SURVEY2	African partners
Enhanced local work on culture - "a really good thing"; Brings people/teams together – "we now have a whole team working together looking at what works elsewhere - helps with a cross matrix of learning and ideas"; A way of thinking: the resourcefulness of our partners led us to consider our use of resources.		Sharing of technical ideas; Training/sensitization (linked to our strategy); Increases our professional capacity through exchange visits.

UK partners	SURVEY3	African partners
"Confirmed the value of patient safety in our Theatres"; "Helped establish the surgical checklist"; "Improved awareness (high standards of hygiene)"; "Good for culture development"; Demonstrates social responsibility; Can give a sense of perspective, especially on effective use of limited resources "Increased support for the partnership from different departments		"We were able to move faster towards our goal than we would have on our own"; Specific improvements to local systems e.g. data capture Enables the sharing of options.

CSV 17 highlights some additional feedback from the partners emerging from the survey.

CSV 17: In the partners' own words

"The partnership quickly established a firm friendship and a very high level of trust between the principal partners. The language barrier was overcome and communication improved throughout the duration of the project." *Beira Central Hospital–Ipswich Hospital Partnership*

"Partnership visits helped us to establish trusting relationships with members of the APPS team in Mbeya." *Mbeya Referral Hospital, United Republic of Tanzania–North Cumbria University Hospitals NHS Trust*

"Partnership visits and the support of hospital management have been the biggest catalyst for change." *Ndola Central Hospital–Guy's and St Thomas' NHS Foundation Trust*

Further qualitative exploration of partnership strength that took place during the Harare learning symposium reinforced the survey findings and generated a number of thematic areas from the partners on what they considered to be critical learning from the two-year APPS experience. Table 7 summarizes the emerging themes.

Table 7. Key lessons emerging from use of the partnership approach (learning symposium)	
Theme	**Learning**
Human resources	Succession plan – train for success (teams not individuals) Ensure the right skills mix and involvement of multiple professions, e.g. pharmacy involvement and stronger role of nurses as partners Involve action-oriented/active and energized individuals – nurture junior staff Consider appointing a paid coordinator Consider incentive schemes
Awareness raising	Increase awareness at board level, with WHO support Develop and constantly review memorandum of understanding Work on consistent messages Lobby ministries of health, local media, nongovernmental organizations (NGOs) and community leaders
Communication	Commit to regular, frequent communication to secure hospital buy-in Provide regular feedback to support financial commitment United Kingdom partners must invest in understanding local context in African hospitals Transparency is critical in feedback to supporting organizations
Fundraising	Explore all avenues for funding to sustain the work – apply for grants, consider NGOs
Networks	Develop local and regional peer–peer networks Use existing meetings that allow cross-fertilization and revitalization
Roles and responsibilities	Delegate clear responsibility to the partnership leads Set clear and realistic expectations and goal for visits As roles evolve ensure local support networks are in place

Question 3: How does the APPS approach impact spread?

Progress on patient safety spread
Progress on patient safety spread was limited within the two-year implementation period. However, a number of examples of in-country and between-country spread were reported. Box 7 outlines the highlights of the evaluation.

Box 7. Highlights of the patient safety spread survey
100% of partnerships participated in the baseline patient safety spread survey. The patient safety spread survey was repeated a further two times by two partnerships and once by the remaining three. Based on all sources of evaluation information the following highlights emerged: • All African partners cited evidence of in-country spread.   • Mechanisms for hospital–community linkages were developed in each partnership hospital to enhance spread.   • There was limited progress made at the partnership level in publishing results of APPS involvement in the scientific literature.

The survey results highlight critical areas where further work is required to stimulate spread, largely centred on advocacy and campaigning, including the publication and promotion of activity. Figure 6 illustrates the survey findings.

Figure 6. Patient safety spread survey findings

1. Organized or participated in an event e.g. workshop, meeting, seminar, or training course on patient safety in your hospital, other hospitals or nationally?
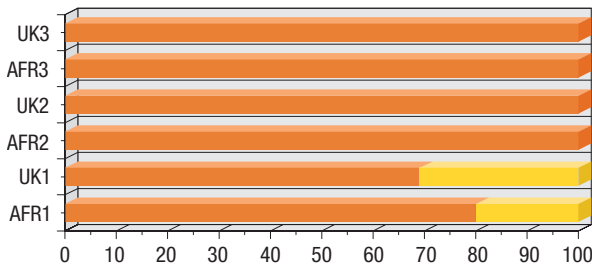
2. Identified patient safety champions across multiple disciplines and at senior levels?
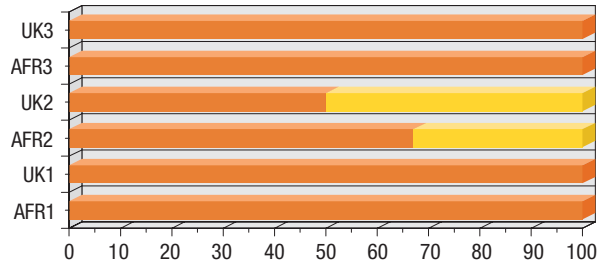
3. Started or been involved in any patient safety campaigns e.g. working with local radio and/or other media to promote patient safety or securing celebrity endorsement for patient safety improvement?
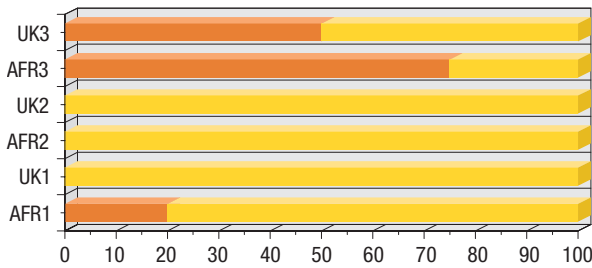
4. Written up any patient safety publications and/or case studies?
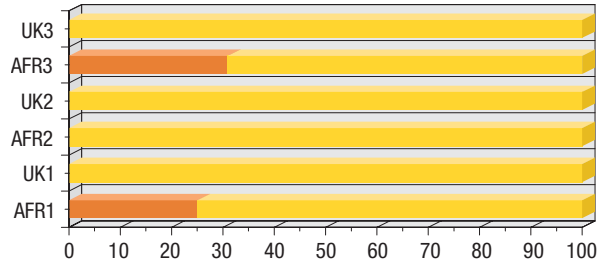
5. Become aware of other hospitals in your country now improving patient safety?
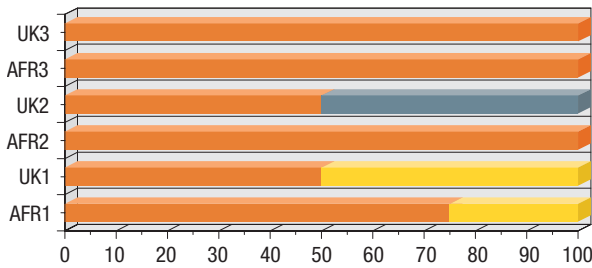
6. Had any contact with the Ministry of Health or WHO Country Office to discuss patient safety?
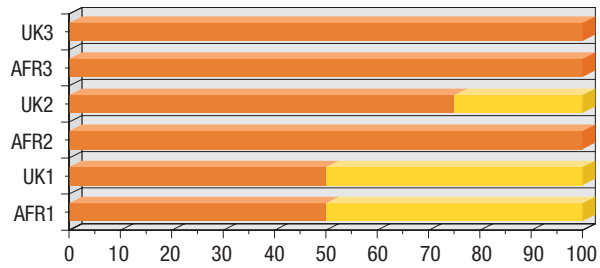
7. Been involved in any events to launch patient safety improvement?
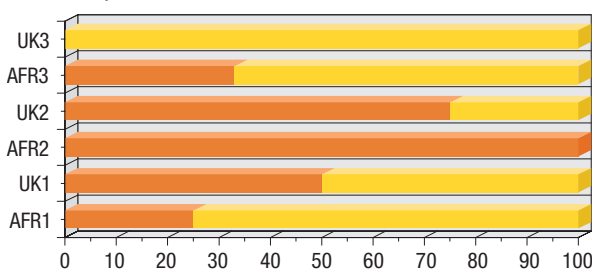
8. Become aware of any patient safety networks that have started in your area or country?
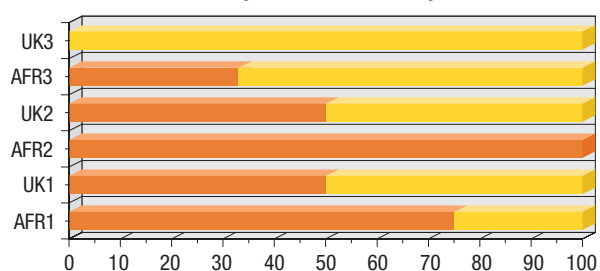
9. Secured support from the Diaspora in Europe or elsewhere for the work you are doing?
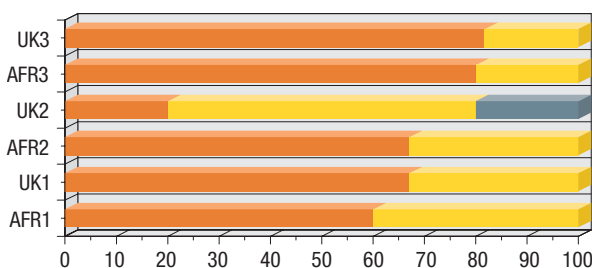
10. Secured any funding for any aspect of the patient safety activity in addition to APPS-related budgets (now or in the future)?
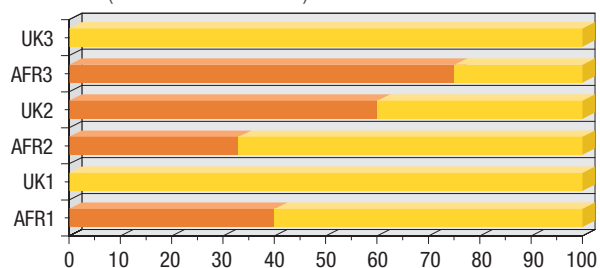
Legend: Yes, No, Not applicable

Some notable findings relate to the gradual increase in organization and participation in national workshops and meetings across the three surveys. Perceptions on campaigning and advocacy were influenced by what was considered the appropriate time to start such activities. As one African partner explained at baseline: "This is a timing issue – as we continue to institutionalize these processes we can at some point bring in other figures to campaign" (Africa, survey 1). Another African partner commented: "We have had discussions – but we want to get systems right first – fear of litigation is a concern" (Africa, survey 1). One of the questions focused on whether the partners believed that the APPS partnership had stimulated spread of patient safety improvement to other hospitals in-country. Examples are summarized in the following case study vignettes.

CSV 18: Beira–Ipswich

Key points:

Following the partnership decision that Beira Central Hospital would instigate a system of wound infection surveillance for patients undergoing lower section caesarian section or hernia repair surgery, this practice has now been adopted as a national programme within Mozambique.

The improvement–spread interface was highlighted when Beira Hospital became the first in Mozambique to implement the widespread use of the surgical checklist. In 2013, the Ministry of Health of Mozambique requested all hospitals in the Central region of the country to introduce the checklist. APPS team members from Beira have been pivotal in sharing their experience with colleagues from across the country. This has led to national recognition of Beira as leaders in implementation of surgical safety.

CSV 19: Ndola–Guy's and St Thomas'

Key points:

Two of the APPS projects were presented at the National Health Fair with commendation from the Ministry of Health and award of first prize.

CSV 20: Komfo Anokye Teaching Hospital–St George's

Key points:

Spread focused on two of the action areas that the partners worked on during the implementation phase: IPC and safe surgery.

The IPC nurse carried out training in hand hygiene within seven community hospitals in the Kumasi area (November and March 2013); Tamale Teaching Hospital, with representatives from other hospitals in the northern sector; Korle Bu Teaching Hospital (2013); and further afield in Sierra Leone (2013).

A sensitization workshop was organized for the Traditional Herbalist Association (2013).

During the inauguration of the Nutri-Health and Hope for Humanity (NH_3) organization, a talk on the importance of hand hygiene was delivered.

The WHO Hand Hygiene Day of Action (5 May) was leveraged to create awareness of the importance of hand hygiene.

Training took place in 34 district hospitals and 70 clinics on safe surgery. Both nurses and surgeons were included in the programme. A sensitization workshop of a nurse anaesthetists' group addressed a total workforce of over 400.

CSV 21: Mbeya–North Cumbria

Key points:

The alignment and synergistic effect between APPS and the Kaizen 5S approach was explored by the Ministry of Health in a national meeting to harvest this experience for use across the United Republic of Tanzania.

Spread at the programme level

At the programme level, APPS has stimulated action that is contributing to the spread of patient safety as a movement and an activity. The outputs listed below would not be possible without the granular information provided from the partners themselves through their improvement and implementation efforts.

African Region patient safety policy and strategic planning workshop

In 2013 a five-day workshop aimed at raising awareness, knowledge and skills concerning patient safety and service delivery was held in Harare, Zimbabwe *(32)*. Representatives from 20 African Region countries gathered from eastern and southern Africa to learn the process of patient safety policy and strategic plan development, activity planning, monitoring, evaluation and refinement. Each country was represented by a team consisting of focal points from the ministry of health, WHO country office and selected hospitals. This allowed cross-country learning and the creation of a platform to continue to develop policy and plans based on the implementation experience of the APPS partnership hospitals. The sharing of experiences was initiated by presentations from APPS partnership hospital leads. These rich contributions enhanced development, consideration and discussion of ideas by participants. This was also the first opportunity to utilize the pilot version of the *African Region development guide for patient safety policy and strategic plan.* The workshop and subsequent actions led to a call for "implementation-driven" policy-making, representing a change in the policy-making process.

World Health Assembly 2012–2014

The World Health Assembly provided a platform for advocacy in support of knowledge transfer and global spread. During the period 2012 to 2014 a number of technical sessions and events provided an opportunity to secure a place for discussion and presentations on the APPS approach.

At the sixty-fifth session of the World Health Assembly, Geneva, 21–26 May 2012, a technical session on patient safety, requested by the Minister of Health, Supreme Council of Health, Qatar, was facilitated by WHO. The session aimed to share achievements in patient safety since World Health Assembly resolution WHA55. 18 (2002), and served as a renewed call to action to promote patient safety as a fundamental principle of all health systems. One of the first-wave APPS partners, from Uganda, gave a presentation to the technical session on the progress and challenges of improving patient safety in rural Uganda. A progress report on progress with regard to patient safety was delivered by Mauritius on behalf of the African Region at the sixty-sixth session of the World Health Assembly, Geneva, 20–28 May 2013 (see CSV 22 for key highlights from 2012 and 2013).

At the sixty-seventh session of the World Health Assembly, Geneva, 19–24 May 2014, as part of the expansion of the APPS network, stakeholder engagement meetings focusing on technical cooperation were held with country delegations from Angola, Benin, Botswana, Cabo Verde, Eritrea, Ghana, Liberia, Mozambique and South Sudan, and with the Japan International Cooperation Agency and the African Centre for Global Health and Social Transformation.

World Health Assembly 2012
Dr Tonny Tumwesigye (medical superintendent, Kisiizi Hospital, Kabale) highlighted how the partnership had made small steps, but still had a long way to go. He focused on the need for continued support in terms of global thought leadership to guide local action, but emphasized his belief that local action can also inform global thought leadership: "What can we do with the limited resources we have? If we fail and learn that is indeed success."

World Health Assembly 2013
Mauritius stimulated debate on the growth of patient safety importance across the African Region at the regional, national and local level, and how this is slowly being evidenced by the increasing financial and human resources for health earmarked for interventions aimed at enhancing patient safety. "As we draw close to the year 2015 and take stock of progress towards achievement of MDGs, it is evident that countries within sub-Saharan Africa have yet to catch up with other regions. As new approaches across the African Region – especially in terms of entry points for action at point of care with a view to promoting positive health outcomes – are more than ever felt and needed, patient safety emerges as a core entry point for achieving better health outcomes in relation to the MDGs and more specifically in relation to maternal and child health."

United Kingdom-based efforts (THET)
Additional evidence of spread stimulated by the broader APPS programme is the decision by THET – the main stakeholder partnership-focused organization within the United Kingdom with whom the APPS programme worked – to incorporate patient safety as one of its three thematic areas for its recently launched Health Partnership Scheme.

WHO work with Member States
Following the Harare patient safety policy and strategic planning workshop, and the sharing of the APPS experience, requests for technical cooperation in patient safety policy development were responded to in Benin, Botswana, Eritrea, Ghana, South Sudan and Zimbabwe. Zimbabwe has commenced a five-year programme on IPC funded by the United States Centre for Disease Control with strong Ministry of Health involvement. Through its quality assurance and quality improvement programme the ministry has outlined patient safety as a central pillar of activity, and the APPS PSSA has been undertaken in over 100 hospitals. The resulting work across these countries highlights how APPS is stimulating change at both the hospital and policy level.

Addressing the shortage of alcohol-based hand rubs in Africa
Two major developments have taken place. First, to address the immediate challenge of procuring the necessary hardware for containing alcohol-based hand rubs (mainly plastic bottles) following local production, WHO APPS worked collaboratively with POPS in the development and execution of a one-off project to provide a start-up supply of plastic bottles to all of the APPS second-wave hospitals. Second, in light of the multiple barriers to local production highlighted by the APPS first- and second-wave partnerships, WHO Service Delivery and Safety applied through the WHO system for alcohol-based hand rubs to be placed on the Essential Medicines List. This was approved in April 2015 and will help in securing a sustainable solution to many of the existing barriers.

WHO Collaborating Centre for Global Health through South–South Collaboration, Oswaldo Cruz Foundation (Fiocruz), Rio de Janeiro, Brazil
As part of the long-standing collaboration with WHO ePORTUGUESe, APPS has influenced the focus and activity of the new WHO Collaborating Centre, Fiocruz, to progress support to the Portuguese-speaking arm of APPS in Angola, Cabo Verde and Mozambique. This collaboration has also strengthened the technical collaboration with Proqualis, the national organization for safety and quality, Brazil.

Armstrong Institute for Patient Safety and Quality, United States
A collaboration with the Johns Hopkins Armstrong Institute led to an expansion of the APPS network into Liberia and South Sudan in 2014, and for the first time a collaboration with a faith-based national network of health facilities in Uganda. This partnership has been actively involved in the preparedness and response activity of the current Ebola virus disease outbreak.

APPS convened the Global Catalyst Group for Institutional Health Partnerships. The group provides a "patient safety bridge" between organizations with a focus on partnership-based approaches to health system improvement. It brings together multiple global organizations and promotes the utility of institutional health partnerships in strengthening health systems and in delivering effective health services through resources, positions statements and collaborative activities *(33)*. The position statement, published in a journal, has influenced thinking on the use of a partnership-based approach for improvement (Annex 7). The current group membership comprises APPS, American College of Healthcare Executives, International Hospital Federation, ESTHER and THET.

Question 4: What are the barriers and opportunities relating to implementation?

Information on the barriers encountered in implementing patient safety improvement was generated through partnership reports and face-to-face group discussions. Analysis of the feedback highlights a number of thematic areas. There are multiple parallels with the findings of previous APPS reports. Themes are presented in Table 8 together with opportunities to address each area, generated by the partnerships themselves.

Table 8. Barriers and opportunities

	Barriers	Opportunities
Infrastructure	Inability to obtain affordable raw ingredients/materials (alcohol-based hand rubs/bottles) Limited stocks/supplies of essential resources, e.g. laboratory consumables Inadequate infrastructure, e.g. sinks	Important to understand mechanisms and limitations of procurement and supply of essential resources when planning partnership activities Consider programma of replacement or refurbishment of equipment and infrastructure Increase the utility of the POPS–APPS mechanism for improvement
Leadership and teamwork	Low physician involvement Hierarchies and empowerment (or disempowerment)	Engage staff from all backgrounds Leadership development through fit-for-purpose context-specific curricula – for Africa, by Africa
Community engagement and advocacy	Patients' and visitors' rights and responsibilities not well defined	Educational/promotional activities should target these groups Lobbying ministry, local media, NGOs, community leaders
Knowledge and learning	Guidelines exist – the barrier is often implementation Lack of audit experience Blame culture Resistance to change Data collection due to competing demands for data from other actors Lack of national definitions, surveillance protocols and management (health care-associated infection) Difficulty collecting and feeding back real-time data	Support move to open/just culture to encourage honesty and accuracy of reporting Use all available data to avoid duplication Collect surrogate data on practices and behaviours, e.g. hand hygiene compliance, use of alcohol-based hand rubs, health care workers' perceptions Consider using emerging partnership technology to facilitate data collection and feedback in real time Develop "frugal" research and learning mechanisms for African hospitals

	Barriers	Opportunities
Partnership-based approach	Institutional changes have potential to destabilize partnership	Succession planning – don't rely on individuals – delegate
	Team changes (influenced by high turnover) destabilize partnership	Nurture organizational buy-in – develop memorandum of understanding
	Communication and language constraints	Advice and support for travel
	Travel complexities (visas)	Notice boards in clinical areas for key information
	Lack of organizational awareness	Consider other forms of information sharing apart from print media
		Increase work with partnership-focused organizations, e.g. THET, ESTHER
Financial/human resources	Lack of financial support for patient safety and community engagement	Consider cost-sharing options
	General shortage of human resources, particularly IPC personnel	Publicize findings of APPS to strengthen case for patient safety
		Comparative studies and meta-analysis of data to provide hard numbers for publication in high-impact journals

Question 5: Do benefits flow back to the NHS?

Within the Harare learning symposium partners worked in teams to consider and synthesize key benefits that had already flowed back to – or had the potential to flow back to – partners in NHS hospitals. This was blended with findings already generated through the evaluation process. The results are presented in Table 9.

Table 9. Benefits that could flow back to NHS	
	Perceived/actual benefits
Patient safety	Increased profile of patient safety and IPC
	Enhanced understanding of holistic care and compassion as part of quality
	Stimulated to refocus on and develop health promotion videos
	Rethinking how to address management deficiencies, e.g. stimulated by observations of doctors on call for 24 hours (in African partner hospital)
	Greater adaptability in teaching sessions
	Increased improvement in (surgical) checklist compliance – stimulated to progress to look at the quality of compliance – to avoid it being a meaningless tick box activity
	Improved use of surgical checklist, replicating how partner hospital approached implementation
	Improved clinical and teaching skills, including awareness and understanding of global diseases and global health challenges
	Value of simplicity in e.g. policy development Promoting IPC as key aspect of patient safety agenda Potential to share learning across organization to maximize benefits and impact
Leadership development	Working within African health care systems can yield rapid improvements in leadership and management skills at minimum cost
Problem solving	Greater confidence – dealing with the situation you have Enhanced perspective Opportunities for joint research Creation of specialist networks helping sustain improvements

Rethinking use of technology	Greater focus on clinical skills and common sense – think before incurring additional cost
Culture	Enhanced working across cultural and ethnic minority groups – greater awareness of cultural context and sensitivity
	Motivation level increases
	Learning hospitality/friendship "soft" skills
Team working	Enhanced ability to work under pressure
	Continuing professional development – joint publications
Patient/community engagement	Expanded understanding of carer/guardian involvement
	Opportunity to engage with local community
Corporate social responsibility	Enhanced reputation
	Fulfils moral responsibility towards humanity as a whole
Efficiency/ productivity	Avoidance of waste and use of available resources – lateral thinking
	Different ideologies and ways of working, e.g. training methods and task allocation can be translated to the organization with a positive impact on workforce development and productivity

One of the key findings of the evaluation is how a partnership approach focused on patient safety rather than a single technical discipline draws in people from multiple disciplines and teams. This was stated as having direct benefits to NHS teams (CSV 23).

CSV 23: Improving teamwork and generation of ideas in the NHS: examples from two trusts

Key points:

Reinvigorating a long-standing link: The partnership between St George't University Hospitals NHS Foundation Trust (United Kingdom) and Komfe Anokye Teaching Hospital (Ghana) is a long-standing partnership that preceded its involvement in WHO APPS. The decision to join the WHO patient safety partnership movement has reinvigorated the link and, in the words of the United Kingdom partners, expanded the diversity of the actors involved from a narrow niche focus on infection prevention to a truly multidisciplinary team spanning the entirety of patient safety. This has reaped benefits within the NHS hospital in terms of teamwork and understanding and appreciation of roles.

Utilizing Kaizen 5S: At North Cumbria University Hospitals NHS Trust, hospitalwide publicity for the APPS programme within the trust increased staff awareness of the North Cumbria–Mbeya partnership and contributed to raising the profile of IPC. In particular, engagement in APPS enhanced understanding of quality improvement approaches such as Kaizen 5S, stimulating thinking on how such an approach can be utilized in North Cumbria.

Question 6: Is reverse innovation and innovation flow a by-product of the programme?

Partners were stimulated to consider what they perceived to be the key innovations introduced through the partnership. Information generated was synthesized with a focus on how the benefits from the identified innovations might have a wider impact. Group discussion was stimulated using the Agency for Healthcare Research and Quality–Health Care Innovations Exchange definition of innovation: "the implementation of new or altered products, services, processes, systems, policies, organizational structures, or business models that aim to improve one or more domains of health care quality or reduce health care disparities". Table 10 summarizes the innovations generated during the discussions.

Table 10. Innovations emerging	
Innovation category	**Example**
IPC	Local manufacture of alcohol rub – potential to scale up, generate income
	Portable water containers with taps
	Provision of hand hygiene facilities for visitors/guardians
	Promoting nurse champions – empowerment of nurses to implement local IPC policies
	Development of model wards
	Cascade training for hand hygiene
	Colour coding (waste management) using existing supplies and processes (cost neutral)
	Protocol for washing mattresses to prevent wastage/ensure safety
	Flexible/bespoke system for hand hygiene accountability – job descriptions
	Monthly round and award for best area
Patient safety	Training of police, fire crews and ambulance drivers in patient safety
	Patient safety nurse
	Use of sensitization days for communities
	Use of community nurses as advocates of safety
	Enhanced role of pharmacist in safety
	System for sustainable funding – directorates contribute to patient safety to improve ownership
	Development of new consent form for surgery
m/e-technology	Handheld tablet devices and RATE system for audit (see case study 24)
	Mobile phone technology and paper-free working on both arms of partnership
	Turning point technology for polling staff view on patient safety and culture
Literacy/linguistic innovation	Translation of key materials into Portuguese, e.g. pulse oximetry training package and WHO hand hygiene compliance audits (former used by LifeBox charity)
	Production of partnership newsletter in English and Portuguese
Advocacy	Development of education pack for patients – education manual plus video
	Local language video for health promotion

Mechanisms to spread the innovations listed included publishing in academic journals, sharing with others through the APPS web platform and lobbying for funding for some of the technological innovations listed.

CSV 24: Reverse innovation at St George's NHS Trust – in their own words

Key points:

"During our visit to Komfo Anokye Teaching Hospital (KATH), my role was to introduce our real-time data collection tool. This involved setting up 10 tablet computers and training staff how to use the system to quickly turn around their audit data. The system itself is driven by a combination of a mobile and web app. Data is collected via the tablet computers, then uploaded to the reports via Wi-Fi."

"When working with the team at KATH, we identified a number of areas for improvement – both in the website and the mobile app. These improvements centred around making the app work better when not connected to a Wi-Fi network, and transmitting smaller amounts of data when it was connected. I was able to make these changes and test them out during the project."

"The visit provided a chance for joint exploration of this new technology and the exchange of ideas. The opportunity to test the functionality has allowed for what is termed 'reverse innovation'. To illustrate this, following our visit, the app and website are now much more efficient back at St George's – they are able to more quickly transmit data, meaning faster loading times and also better performance when not connected to the Internet; something that is equally as important in all countries where frustration from

Internet connection continues. I feel that this will greatly help us when we roll the system out to our community in South London, and in the outpatient sites later this year."

"Our most recent visit showed how technological ideas that can improve patient safety are transferable and that learning is a two-way process. I was really impressed by the appetite of the clinical audit team at KATH for adopting and adapting the new system. The feedback and help of our partners has been invaluable.

St George's University Hospitals NHS Foundation Trust, **United Kingdom**

CSV 25: Project CONNECT – using the APPS community engagement approach in East Baltimore

Key points:

Project CONNECT (Community-based Organizations Neighborhood Network: Enhancing Capacity Together) is a co-developed initiative between Johns Hopkins academic researchers and community-based organizations (CBOs) in the East Baltimore area. Funded by PCORI (Patient-Centered Outcomes Research Institute), the overarching goal of CONNECT is to improve the health of East Baltimore residents by enhancing communication and co-developing a community engagement partnership between Johns Hopkins hospitals, clinics, CBOs and the East Baltimore community. The APPS community engagement approach has been adapted by the CONNECT team, highlighting a reverse innovation approach whereby a community engagement approach that has successfully been used in Africa is being implemented in East Baltimore. Understanding the critical need to strengthen relationships between local Johns Hopkins facilities and CBOs, the adaptation of the APPS community engagement approach through CONNECT is a co-developed endeavour to target high-risk adults with chronic conditions and improve patient health outcomes.

SUMMARY OF LESSONS LEARNED

Table 11 presents a synthesis of the lessons learned across each of the evaluation areas, based on all data sources and evaluations undertaken during the five-year period. This includes the formal evaluation results, partnership reports and meetings, with a focus on what the partners perceived worked. Partners were specifically asked to consider the advice they would give to other partners on how to effectively improve patient safety using the APPS approach, based on their experience and lessons learned.

Table 11. Summary of lessons learned	
1. Patient safety improvement	
Awareness raising, sensitization and advocacy	One of the first steps in moving to success
	Learn the lessons from hand hygiene
	APPS is about global learning and local benefits for patients and staff on each arm – emphasize mutual benefits
	Talk to other NGOs and organizations already working in partnership hospitals – the sum is greater than its parts
The impact of the health system is critical, particularly in relation to:	Human resources – a critical determinant of the pace and scale of change
	IT systems – impact on communication and data collection
	Supplies and logistics including distribution challenges – hampered efforts to improve IPC systems through expanding access to alcohol-based hand rubs
	Management and leadership – important role of hospital management in supporting patient safety improvement
	Antimicrobial resistance and laboratory capacity – link with national and international improvement work
Building a patient safety culture takes time	Important not to be overambitious
	Engage senior managers
	Sensitize health care workers through training and education and advocacy
	Use multiple channels for advocacy – radio, newspapers, posters (local language)
	Involve as many people as possible – to foster empowerment and ownership and facilitate adaptation
	Accept that progress will be slow. Focus on one or two priorities in the partnership plan that are agreed upon and see them through to the end

Baseline assessment	The PSSA allows for the setting of small, achievable goals. Choose interrelated action areas. Start with basic principles of patient safety.
	Policies and guidelines – a good start (co-development across partnerships)
	Power of data – use all available data. Measurement is important – small results have big impact. Integrate with existing frameworks. Develop SMART plans
Awareness of context and need for adaptation	Adapt the six-step cycle, develop contextual training materials, take front-line realities into account, simplify interventions, choose simple starting points, simplify tools (simplicity versus complexity) – "Let's not export some of the United Kingdom's perhaps less than scientific practices"
	Adapt implementation approaches (e.g. surgical checklist and WHO multimodal hand hygiene improvement strategy)
	Hospitals with existing quality improvement culture (United Republic of Tanzania) moved more rapidly in patient safety improvement than those without such foundations
2. Partnership strength	
Leadership and teamwork	Securing the right partnership lead is essential for success Building a strong core team, then smaller teams, helps leverage support for patient safety
	Agree a partnership vision and develop a clear memorandum of understanding, signed on both arms using existing templates, e.g. THET
	Tap into emerging expertise in global health partnership leadership initiatives, e.g. THET, ESTHER
Role of partnership visits	Harness passion, motivate teams, enable co-development of solutions and ensure visits are a fulcrum for change, recognizing that most of the work occurs between visits
	A strong partnership is a catalyst for change
Communication	Agree preferred mechanism, schedule regular contact, protect time and cascade communication across the partnership
	Provide regular feedback to the hospital to secure buy-in Expand use of social media and online APPS web platform
Celebration	Important to celebrate success and enjoy the experience
3. Patient safety spread	
Influencing national policy/agenda and vice versa	Partnerships do have potential to influence policy-level action
	Early engagement of senior hospital leaders/executive decision-makers as part of the patient safety team is important (they can engage national decision-makers)
Leverage national/ international events	Use national events to launch/communicate/advocate and sensitize influential others on patient safety – small-scale spread to local district hospitals influences the spread trajectory
	Use existing global days of action, e.g. WHO Save Lives: Clean Your Hands, 5 May

Engage others	Community engagement holds untold and untapped potential to help make a fantastic leap forward – particularly patient safety as a rights-based issue
	NGOs, WHO POPS, diaspora, academia, faith-based groups and local and national media – can be critical in stimulating spread
Spread is happening	The expansion of the APPS network is showing signs of aiding spread – greater publicity and encouragement of non-APPS partnerships to join the movement
Patient safety and service delivery	Ensure patient safety is seen as a core element of effective service delivery and not a stand-alone issue
	Ensure clear linkages between patient safety and quality and universal health coverage to increase the potential leverage within the national system
2. Benefits to Europeanhospitals	
Teamwork and staff development	Enhanced working under pressure
	Continuing professional development/opportunities for research and publication
Simplicity versus complexity	Ideologies and approaches from low-resource settings aid resourcefulness and scrutiny of conventional systems
Cultural awareness	Enhanced "soft" skills, cultural sensitivity and compassion
	Enhanced staff motivation that can spread beyond individuals
Reputation	Corporate social responsibility and philanthropy
Technology	Fresh thinking on implementation of technologies in the NHS, learning from the emerging innovation to address constraints in partner hospitals
Quality improvement	Refocus and reinvigoration of thinking on quality improvement methods (e.g. Kaizen 5S) – igniting new action
5. Barriers and opportunities	
Community engagement	Greater promotion and use of APPS approach to community engagement
	Expand use of local media to get messages to community
Funding	Verbal commitment must be backed up with funding
National policies	Anticipated expansion in national policies will support on-the-ground improvement and strong linkages between patient safety and quality and universal health coverage
Infrastructure challenges	Lack of availability of raw materials, e.g. bottles and alcometers, and barriers in supply chain and affordability can be minimized through leveraging existing initiatives, including WHO POPS, biomedical engineering projects of partnership-focused organizations, quality improvement methods and exploring NGO funding sources
	Promote local manufacture of WHO alcohol-based hand rub formula through engagement of local enterprises

6. Innovation	
Technological	Local production of alcohol-based hand rubs
	Tablet technology to strengthen audit and feedback and staff polling (to determine organizational culture)
	Mobile phone technology for patient safety, e.g. antibiotic prescribing, surveillance (use of apps)
	Functional microbiology lab hood created from parts that were discarded from their primary intent, when no money for hood purchase exists
Advocacy and patient engagement	Development of advocacy materials on patient safety in local languages
Cultural adaptations	Refining the WHO safe surgery checklist to include a question on prayer (in keeping with the norms of the faith-based institution)

STRENGHTS AND LIMITATIONS

One of the main strengths of the evaluation is that it addresses an area of global health partnerships that to date has received little focus – the impact of health partnerships on patient safety in developing countries. The evaluation findings therefore add value to the body of knowledge in this area. This will help enhance current understanding of what works and what does not, and contribute to the broader public health debate on health partnerships related to impact and outcome.

Related to this central strength, a recent systematic review of the impact of health partnerships to the NHS, described earlier, found that in conventional partnerships a limiting factor tends to be the small number of individuals involved – potentially reducing the likelihood of benefits being realized at the institutional or even national level. APPS addresses this inherent weaknesses in that it is concerned with a multidisciplinary team approach and focuses not only on institutional buy-in from the outset, but also on securing and nurturing national-level awareness and support, within the framework of a WHO regional mandate. The evaluation takes place within this context.

As the evaluation results illustrate, the power and strength of APPS also rest with its dual emphasis on the "what" as well as the "how" of patient safety improvement. APPS offers not only a proven, co-developed, multifaceted improvement framework and associated implementation resources, but importantly the learning emerging from the programme over a five-year period goes some way to describing the much neglected "how" of improvement.

The use of robust and reliable tools to gather evaluation data is also a strength of the approach. The HHSAF is a validated WHO tool. The PSSA, partnership strength and patient safety spread surveys have face validity, their strength resting on the previously described participatory approach

to development. The same information was obtained across all sites using these standardized instruments, which did not require special training of data collectors. However, situational effects cannot be ignored. It is possible that partners may have behaved differently under the conditions in which the surveys and group feedback sessions were undertaken.

There are a number of additional limitations of the evaluation, common to programmes attempting to measure improvement in the context of complex sociotechnical systems. The extent to which the effects of the APPS programme are due to the programme itself or influenced by other factors cannot be determined with any certainty. The observational nature of the evaluation with a six-month to one-year time interval between data collection means that during this time, as well as the APPS improvement interventions, other factors outside the scope of the evaluation could have occurred that, although not directly focused on patient safety, could influence the partners and subsequently the dependent variables and therefore the evaluation findings. It was not possible, due to the design of the evaluation, to explore the influence of confounders. However, the evaluation does go some way in mitigating this, given that methods were employed across 14 hospitals in the African and European Regions of WHO, over a five-year time period. Attempts were also made to ensure diversity in the type of organizations. APPS has involved small faith-based organizations through to major university teaching institutions. This diversity addresses to some extent the external validity of the evaluation. APPS hospitals in Africa are likely to be representative of other hospitals in the region. This strengthens the generalizability of the findings and their relevance to regional and national policy.

The type of data collected also constitutes a limitation. Although there is an abundance of

data generated on infrastructures, actual improvements that have been implemented, policies written (locally and nationally) and numbers of personnel who have undergone training, there is a limited amount of data on patient outcome. This is not uncommon in patient safety and infection prevention evaluations even in the most advanced health systems. Data collection was severely impeded within the APPS evaluation due to weak and therefore limited health information and surveillance in the African hospitals. Furthermore, the evaluation did not seek to measure staff perception or attitudes that relate to the institutional safety climate, making it difficult to ascertain whether the improvements described as a result of the programme are transient.

Taking into account the limitations, the evaluation approach employed was well executed and provides a useful adjunct to existing knowledge that will provide insights in the absence of similar studies in the African region. A more rigorous evaluation, perhaps a comparison study with hospitals not implementing patient safety interventions using the APPS approach, and not involved in a partnership programme, would overcome some of the limitations highlighted here.

With the above limitations in mind, the evaluation framework described and its associated results do provide valuable information on the likely impact of the programme on the programme objectives. It is clear from the findings that APPS could be described as effective in that it has to some extent, and across multiple countries and institutions, fulfilled its objectives, and the measures employed suggest promising impact. This foundation will need to be built on further.

A common criticism of conventional health partnerships is that they are small scale, fragmented and unsystematic. APPS counters each of these criticisms and provides a tested framework that has potential to catalyse improvement in a sustainable way.

DISCUSSION

The results describe the inception and execution of a patient safety project spanning Europe and sub-Saharan Africa. On the whole the project was set up and executed within the time lines and structures described in the initial project plan. In terms of implementation, APPS delivered a five-year programme covering 17 countries in the African Region, and engaged with local, national and regional stakeholders using a methodology that was co-developed with input from all actors.

At a general level, APPS delivered what it intended to deliver – hospital-to-hospital partnerships that stimulated improvement and delivered results in terms of their outputs and short-term outcomes. Patient safety systems and processes appear to be stronger in each of the participating hospitals in Africa and this is highly likely to be due to the activities supported by and stimulated as a result of APPS. In this regards the programme had the desired effects. The initial aspiration of the programme was to stimulate bidirectional improvement and knowledge transfer, and there is evidence that this occurred. The results seem to have been influenced by a combination of WHO facilitation and support, local energy and commitment and national acknowledgement of the importance of the patient safety work.

One of the defining features of the APPS approach is how it differs from more traditional "vertical expert-driven" technical assistance improvement models. In conventional approaches, technical support is delivered on a specific action area (e.g. IPC) through engagement of experts, often on a one-to-one basis. Interactions are frequently one-off and respond to discrete requests for assistance. APPS turns this on its head by using front-line expertise from across both arms of the partnership hospitals, who commit to a long-term sustained engagement based on human interaction and with an understanding of the importance of mutual benefit, shared vision and institution-wide buy-in, as part of a broader national and international movement. Some of the partnership examples presented in this report describe how front-line passion and energy is driving implementation of patient safety and IPC improvement, which is in turn informing national policy direction.

Global inequalities are increasing rapidly and international partnerships have an important role in tackling this threat. As this evaluation demonstrates, partnerships work best when they are based on sustainable, long-term connections with a strong foundation of trust and mutual support. Effective leadership, good communication, clinical engagement and interagency collaboration are prerequisites for successful implementation in a partnership context. National and regional support and mandates appear to play a supporting role in progressing patient safety and IPC improvement. These findings mirror recent reports on the impact of health partnerships *(34)*.

APPS has taken place in a dynamic context in which insights are emerging on multiple dimensions of patient safety in African settings and political changes have seen shifts in approaches to patient safety in the United Kingdom. What is clear however is that the published literature on evidence-based patient safety interventions in the African context still lags behind high-income countries. This report highlights that issues and solutions from high-income settings cannot simply be applied to African countries, and there is a need to understand the insights presented here from front-line partners to ensure that culture and context are addressed and the necessary adaptation made to existing approaches moving forward.

The evaluation suggests that the APPS model provides a solid framework in support of multiprofessional involvement and offers a structured way to align philanthropic, volunteering work that health partnerships are built upon, to a hard edge of strategic work related to patient safety and quality improvement. APPS provides a very tangible entry point (patient safety and IPC) for broader improvement. It is clear from this evaluation that the pace and scale of improvement was driven by the initial baseline assessment and gap analysis as well as the motivation and involvement of key personnel, including managers and leaders. The experiences and lessons learned suggest that using patient safety and IPC as a clear focal area for action helped to broaden the involvement of health care professionals into the partnership work, drawing in members of the multidisciplinary team who would not normally be involved in such work. This strengthens interdisciplinary teamwork on both arms of the partnership and in particular is a key benefit of partnership work for the United Kingdom. The recent announcement by THET of its focus on patient safety and leadership as thematic areas within its current Health Partnership Scheme gives further weight to the value that patient safety can add in global partnership work.

Based on the learning identified through the evaluation, the APPS approach (including the framework and supplementary tools and resources that assist implementation of tested improvement interventions) has potential to benefit the global health community. Since the APPS network became open access in 2013 there has been a steady expansion of members across the globe.

The differences seen in the scale and pace of implementation across partnerships are likely to be influenced by many factors. The lack of progress over the two-year period as identified by the PSSA in the areas of local patient safety findings influencing national policy, knowledge and learning, patient safety funding, and patient safety surveillance and research reflect the fact that progress in these areas will take many years. The establishment of IPC systems and processes is where the most dramatic improvements have been realized. This appears to have acted as a catalyst for more comprehensive action to address patient safety at the hospital and national level. Improvement in IPC across all partnerships reflects that this area was a common focus for those partnerships, with the most intense and consistent input and a well-tested WHO

multimodal implementation strategy available to support local activity. Those partnerships focusing on safe surgery and the use of checklists, clinical audit and medication safety also reported incremental and significant progress. The factors likely to have accelerated improvement in each of these areas relate to the available improvement strategies, the available expertise on the European arm of the partnerships and the fact that WHO has a decade-long (in some cases) track record in developing and testing improvement tools and a well-established multimodal strategy for hand hygiene improvement. In particular, the HHSAF, where used, appears to have driven targeted improvement activity while at the same time allowing partners to clearly identify progress and barriers.

Infrastructural barriers to progress emerged across all evaluation findings. In particular, access to raw materials needed to manufacture alcohol-based hand rubs and the necessary hardware proved intractable in some cases. The collaboration with WHO POPS has helped in the short term to overcome some of these barriers. Longer-term work by WHO with colleagues in the African Region and using the mechanism of POPS will be needed to overcome supply and distribution barriers to ensure more sustainable solutions to the availability of and access to affordable products in the region.

It is not possible to state with certainty that improvements in patient safety would not have occurred in African hospitals in the absence of the partnership approach. However, through the regular surveys of each partnership and the opportunity to collect a large number of qualitative insights, it seems that the partnership model acts as a catalyst and a facilitator to drive action. This is summarized in the statement from one of the African partners: "We were able to move faster towards our goal than we would have on our own."

In addition, an interesting dimension emerging from the evaluation is the perceived benefits of the partnership approach to Northern partners. Insights have emerged from this evaluation that align with previously published literature *(35)*. In particular, the positive impact that patient safety partnerships have had on teamwork and staff development, shifts in perception and enhanced resourcefulness in the face of complexity are not to be overlooked. In addition, the evaluation has found that European partners describe benefits in terms of enhanced "soft"

skills, including cultural sensitivity, compassion and motivation, as well as increasing organizational reputation and corporate social responsibility. This is aligned with previously cited work on the impact of health partnerships between developed and developing countries addressing benefits to the United Kingdom. Jones and colleagues *(22)* found that despite substantial limitations there was a strong theoretical argument that the skills acquired through such partnerships are transferable to service delivery within the NHS and that the benefits to individuals and institutions could be maximized through their formal embedding within continuing professional development processes. The evaluation and particularly the Harare learning symposium echo these findings.

The importance of awareness raising and advocacy for patient safety and IPC improvement emerged as a common theme across the multiple evaluations that have taken place since 2009. The extent of investment required to build on this and continue to advocate safer health care as a prerequisite for health care service delivery requires further consideration. Linked with this, the need to strengthen the engagement of local communities and civil society in patient safety improvement appears to be critical to success, but further work is needed in this regard. An increasing theme in global health is the need for greater emphasis on the demand side if health outcomes are to be improved *(36)*. The importance of the demand for safe health care among the communities served is an important theme in the post-2015 sustainable development agenda. APPS has incorporated this thinking within its approach since its origins in 2009 and its community engagement framework is well positioned for greater use in health partnership work.

Support for partnerships from the executive and national level within the United Kingdom was variable and this is not unique to the APPS programme. A recent House of Commons International Development Committee report on strengthening health systems in developing countries highlights the resistance to and lack of formal recognition for what the report describes as "volunteering". However, work to address the historical lack of institutional support for such partnerships has gathered pace and is currently been driven by THET with the support of the United Kingdom Department for International Development. The programme was also subject to the influence of profound political changes that had an impact on its standing at the national

level in the United Kingdom, including a change of government and the abolition of the initial host agency for the programme (National Patient Safety Agency).

The programme has faced a number of other significant challenges that cannot be overlooked. Three difficulties stand out in particular that focus on the areas of resources and capacity, stakeholder shifts, and policy alignment. First, given that the capacity of an African partnership hospital is limited in terms of human resources and finances, the foremost priority of the hospital patient safety teams to date has largely been to tackle the real and immediate challenges faced. This to some extent prevented a more rapid progression to achieve the status of national patient safety change agent (or beacon hospital). However, as the partnership matured and momentum increased, there are some notable examples of APPS partnership hospitals assuming high-profile national roles as leaders in the field of patient safety improvement across the African Region. The second matter relates to influence at the policy level. Due to the nature of policy-making and political cycles, rapid shifts in policy stakeholders are common, which has made policy dialogue and strategic engagement by partnerships difficult. Third, patient safety remains a relatively new arena within the African Region and historically hospital partnerships have been considered as peripheral to national health agendas. These challenges are likely to be mitigated in the short to medium term as work on a regional patient safety policy and strategy approach comes to fruition, providing an important opportunity to build on the APPS achievements and accelerate spread.

At the time of writing this report, health system strengthening is a high-priority issue within global health, triggered by the outbreak of Ebola virus disease in West Africa and the role that weak health systems have played in contributing to the magnitude of the outbreak. Health system strengthening depends on multiple interrelated approaches and mechanisms. In 2011, a report by the WHO Secretariat to the Sixty-fourth World Health Assembly on current trends and challenges in health system strengthening highlighted the importance of intercountry exchange, joint learning and institutional twinning. APPS has been at the forefront of driving this evolution of thinking since its launch. The partnership approach described here has tremendous potential to address weak and unsafe health care systems. In the context of the outbreak of Ebola virus disease and its immediate aftermath it is

clear that a new vision is required, one in which IPC and patient safety, a capable front-line health workforce, just-in-time surveillance and information systems and an engaged community all contribute to health system resilience. The APPS approach provides a tangible entry point that has the potential to help build capacity around epidemics and pandemics per se (Box 8). Country-level responsiveness to emerging infectious diseases is heavily dependent on the capacity of health workers in relation to service delivery. Patient safety is a universally relevant, complex and interdependent concept that affects health care service delivery. The body of knowledge developed throughout the years of the APPS programme can be effectively translated into activity to strengthen front-line country-level responsiveness to emerging infectious diseases. Further development of the partnership-based health worker capacity development framework has a potential role in country-level responsiveness to emerging infectious diseases. Further work in this area is becoming increasingly important.

Box 8. APPS supports Ebola response 2014–2015

APPS team members have worked with colleagues in the WHO Department of Service Delivery and Safety and across WHO to support the organizational response to the Ebola outbreak. Key areas of contribution have been in the form of inputs into the rapid update of the "Interim infection prevention and control guidance for care of patients with suspected or confirmed filovirus haemorrhagic fever in health-care settings, with focus on Ebola", as well as plans to expand the availability of life-saving hand rubs, develop training materials and provide support to non-affected countries who are ensuring preparedness and response plans are in place and simulations and drills practised.

The strengthening of IPC as part of the Ebola preparedness and response has helped to build capacity within hospitals and communities to tackle the immediate crisis of Ebola virus disease and also address longer-term challenges with other infectious diseases. Given the crucial focus of APPS on IPC, team members have played a vital role in providing necessary support.

Training of staff has been undertaken across the WHO African Region on areas of IPC, including training workshops in non-affected countries of the eastern and southern Africa subregions. The demand from those attending was for help in increasing their IPC capacity and training, especially around the availability of alcohol-based hand rubs; increased intercountry exchange of activities, knowledge and learning; and effective community engagement mechanisms in order to effectively share correct messages about the disease.

A common criticism of conventional health partnerships is that they are often small scale, fragmented and unsystematic. APPS counters each of these criticisms and provides a tested framework that has potential to catalyse improvement in a sustainable way. These findings, together with previous APPS evaluation reports, act as a pool of knowledge and insights on patient safety improvement and spread through a partnership approach that will be of interest for existing and future partners.

In summary, the results of the APPS evaluation and the learning detailed here add tremendous intelligence into health partnerships and their impact on patient safety, infection prevention and service delivery. The programme has shown that small amounts of funding coupled with partnership expertise on both arms have proven to be catalytic to all countries and has helped drive programme processes. WHO has demonstrated its comparative advantage in influencing on-the-ground improvement and policy development at a regional and national level. Furthermore, the evolution of APPS into an open-access mechanism that has created an active network of patient safety partnerships is resulting in a massive and growing body of knowledge on "how to do" patient safety partnerships. The embryonic stage of development of national patient safety policy across the African Region means that the results presented here have high policy relevance both in the United Kingdom and Africa.

RECOMMENDATIONS

Based on the findings of the APPS evaluation, the following 10 recommendations are made:

1. Policy
Use the findings from this evaluation to:
- Support the emerging drive for national patient safety policy and strategy in the African region, including advocacy and awareness raising, with a focus on implementation-informed policy-making processes.
- Demonstrate to policy-makers in Africa how the APPS approach offers an "off-the-shelf" method of building rapid safety systems at the hospital level.
- Present the case for funding patient safety improvement in Africa.
- Advocate better integration of the APPS approach into national patient safety improvement activity in Europe and Africa – leveraging the benefits to NHS organizations.

2. Leverage the benefits to NHS (and European) organizations
- Advocate full integration of the APPS approach and the assets and expertise available across the NHS networks into current and future work within the United Kingdom to strengthen health systems in developing countries, aligned with Public Health England's Global Health Strategy 2014–2019, and through the Health Partnership Scheme and activities of THET and ESTHER.
- Explore opportunities for future financial support to further develop the programme.

3. Promote hospital-to-hospital patient safety partnerships as part of the post Ebola virus disease resilience agenda
- Build an institutional partnership programme based on APPS and utilizing its existing cadre of expertise (and other institution-to-institution partnership programmes from the United Kingdom and France) to strengthen the delivery of safe, high-quality health services in Ebola virus disease-affected countries. The immediate focus will be on the reactivation of essential health services.
- Establish an evaluation mechanism to determine the impact of the approach on early recovery and long-term systems development.

4. Promote the use of institutional partnerships to co-develop thinking on how to redesign services to be person-centred care
- Advocate greater use of institutional partnerships in improving health outcomes (including public health and clinical outcomes), widening consumer choice (with an emphasis on integrated person-centred care) and recognizing the patient perspective.

5. Promote the use of institutional health partnerships to design integrated service provision within the context of evolving universal health coverage systems
- Target key actors with a focus on European countries (United Kingdom and France) and demonstrate how APPS can act as a vehicle to demonstrate global leadership in the area of system strengthening as a central contribution to the post-MDG agenda.

6. Promote hospital-to-hospital patient safety partnerships within the context of building capacity to address the global antimicrobial resistance challenge
- Use the findings to demonstrate to key actors the contribution that the APPS approach could provide in strengthening IPC, including surveillance systems and laboratory capacity, as part of antimicrobial resistance implementation.

7. **Build on the collaborative work with POPS to address barriers to affordability, supply and distribution of essential IPC products in Africa**
    - Advocate the inclusion of alcohol-based hand rubs on the WHO Essential Medicines List.
    - Work with POPS to explore all barriers to entry in each of the WHO countries in Africa and develop an action plan to target barriers.
    - Explore microproduction units for rapid deployment of alcohol-based hand rubs in emergency settings.

8. **Future development of the partnership model to maximize impact**
    - Focus on the multiple technical and related subject areas of patient safety and IPC and work towards global health workforce solidarity.
    - Further develop the PSSA to enhance ability to generate rapid facility-level data for local and national benchmarking.
    - Strengthen the APPS network and web platform.
    - Work with THET on the Health Partnership Scheme to ensure the cross-fertilization of ideas.

9. **Advocacy**
    - Develop a comprehensive communication and dissemination strategy to ensure findings reach all key actors, including NGOs.
    - Publicize evaluation findings in peer-reviewed journals to enhance spread of knowledge in this emerging field of enquiry.

10. **Community engagement**
    - Community engagement in APPS hospitals has proven to be an asset in enabling local communities to contribute to their own health through awareness of prevention activities in which they can easily participate (e.g. hand hygiene to reduce community epidemics through access to alcohol-based hand rubs in Ghana and Mali and health awareness in schools in Ethiopia and Zimbabwe).
    - Build on community engagement experiences to develop applicable resources for use in the Ebola recovery effort.
    - Utilize hospital–community linkages in efforts to strengthen surveillance for communicable diseases.
    - Work with Project CONNECT to explore findings from East Baltimore that have relevance in the African setting (i.e. global innovation flow).

ANNEX 1
FIRST -AND SECOND- WAVE APPS PARTNERSHIPS

African Partnerships for Patient Safety (APPS): Core partnerships
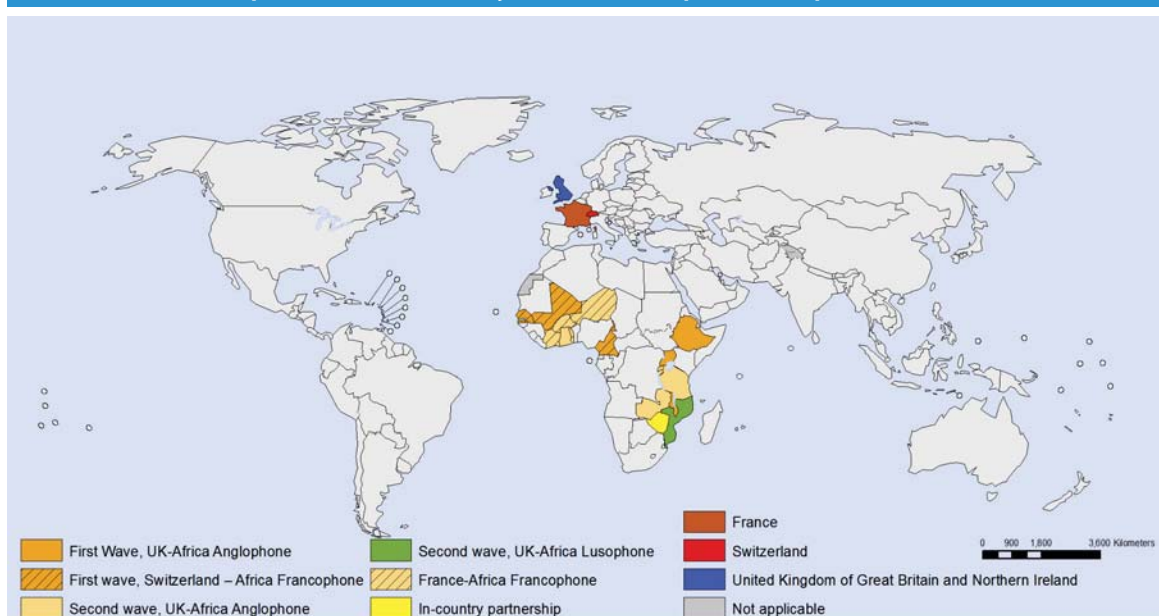
First wave (2009–2011)			
	European hospital	**African hospital**	**African country**
United Kingdom (England)	Countess of Chester Hospital NHS Foundation Trust	Church of Uganda Kisiizi Hospital	Uganda
	South Tees NHS Foundation Trust	Kamuzu Central Hospital, Lilongwe	Malawi
	University Hospitals of Leicester NHS Foundation Trust	University of Gondar Hospital	Ethiopia
Switzerland	Hôpitaux Universitaires de Genève (HUG)	Yaoundé Central Hospital	Cameroon
	Hôpitaux Universitaires de Genève (HUG)	CHU Hospital Gabriel Touré, Bamako	Mali
	Hôpitaux Universitaires de Genève (HUG)	University Hospital Fann, Dakar	Senegal

Second wave (2012–2014)			
	European hospital	**African hospital**	**African country**
United Kingdom (England)	St George's Healthcare NHS Trust, London	Komfo Anokye Teaching Hospital	Ghana
	Ipswich Hospital NHS Trust	Beira Central Hospital	Mozambique
	Imperial College Healthcare National Health Service Trust	Butare University Teaching Hospital	Rwanda
	North Cumbria University Hospitals NHS Trust	Mbeya Referral Hospital	United Republic of Tanzania
	Guy's and St Thomas' NHS Foundation Trust	Ndola Central Hospital	Zambia
France (ESTHER)	Centre Hospitalier Universitaire de Rennes	Prince Régent Charles Hospital, Bujumura	Burundi
	Centre Hospitalier Universitaire de Bordeaux	Hôpital général de Port Bouet	Côte d'Ivoire
		Centre de prise en charge, de recherche et de formation (CEPREF)	
		Maison d'Arrêt et de correction d'Abidjan	
	Groupe Hospitalier Raymond Poincaré-Berck-Ambroise Paré-Sainte Perrine	Hôpital National de Niamey	Niger

ANNEX 2
EXPANSION OF THE APPS NETWORK

African Partnerships for Patient Safety (APPS)
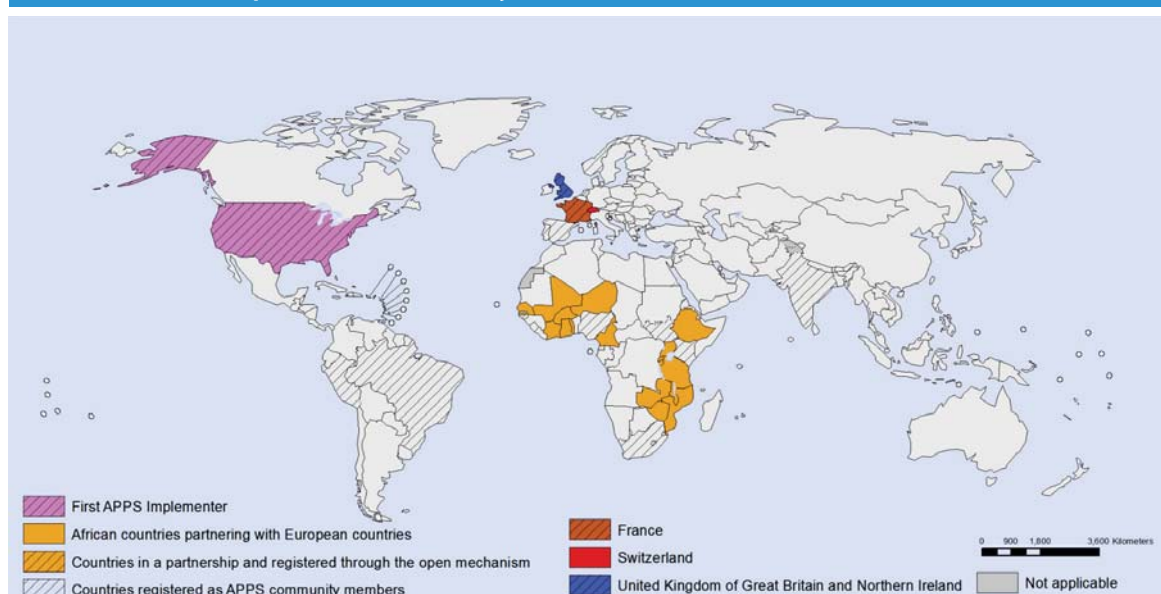
When	2013
What	APPS web-based registration mechanism for hospital-to-hospital partnerships
Who	The network is open to:
	Those working in hospital-to-hospital partnerships involving an African hospital. Such partnerships have an option to register as an APPS implementer, which requires the partnership's commitment to implementing the APPS patient safety improvement framework through the model of partnership.
	For those not yet working in a partnership, or working with hospitals outside Africa, or any other individuals or health organizations interested in patient safety, registration is available as an APPS community member.
Why	Registration allows access to the APPS online community, where experience and lessons are shared and thematic patient safety discussions held.
	All registrants receive the APPS quarterly newsletter.
	APPS implementers are connected with other hospitals in their countries of focus that are involved in APPS, and in particular the focal hospitals that have been participating in the programme with intensive support since 2009.

Why	This open expansion of the APPS network brings a sharing of knowledge and experience and spreads good practice so that more patients and families are receiving health care services within systems that are focused on quality, safety and avoiding unnecessary harm.
Results	Since February 2013 there have been 99 registrations.
	Registrations span 39 countries: Benin, Brazil, Cameroon, Congo, Egypt, Eritrea, Ethiopia, France, Gabon, Ghana, India, Ireland, Italy, Japan, Kenya, Lesotho, Madagascar, Malawi, Mauritius, Morocco, Netherlands, Niger, Nigeria, Norway, Peru, Portugal, Saudi Arabia, Senegal, Seychelles, South Africa, Spain, Sudan, Switzerland, Togo, Tunisia, Uganda, United Kingdom of Great Britain and Northern Ireland, United States of America, Zimbabwe.
How to register	http://www.who.int/patientsafety/implementation/apps/getting_involved_with_APPS/en/

ANNEX 3
SUMMARY OF PREVIOUS EVALUATIONS

When	2012	2014
What	APPS momentum report	Evaluation of a patient safety partnership programme: a briefing paper on the evaluation of African Partnerships for Patient Safety
Method	Review of programme inputs, progress and outputs Case studies	Rapid review of PSSA data to assess outputs and some outcomes Triangulation of data through one-to-one telephone interviews of APPS focal points to gather qualitative information on impact of programme objectives Site visits to three hospitals in Africa (two first-wave and one second-wave): face-to-face semistructured interviews, focus groups, observations
Summary findings	Hospital-to-hospital partnerships can stimulate change but the approach requires continued nurturing and energy from both within and beyond the partnership APPS acts as a trigger for unified action on patient safety with tangible examples of progress made in relation to IPC (hand hygiene improvement) to address infrastructure constraints, affordability and access; community engagement; and safer surgery Summarizes and synthesizes impact and actions since the start of the first-wave partnership in each of the involved countries Key learning presented: • Simplicity versus complexity • A team approach is important • Focus on small goals • The six-step APPS approach offers a systematic framework for action • Measurement is key • Patient safety is a tangible entry point to improve health systems	Partnerships create a pooled knowledge resource and facilitate understanding of patient safety, enabling a bidirectional flow of expertise and solutions They enhance individual and institutional capacity and leadership and act as vehicles for advocacy, and are beginning to influence policy-level action Community engagement is a catalyst for spread Resource constraints and high employee turnover are challenges that have an impact on morale and motivation Leadership capacity, teamwork and succession planning present barriers to success, together with limitations to current communication channels The existing case in support of benefits to Northern partners is weak Three broad recommendations: • Build capacity for national patient safety policy and strategic planning

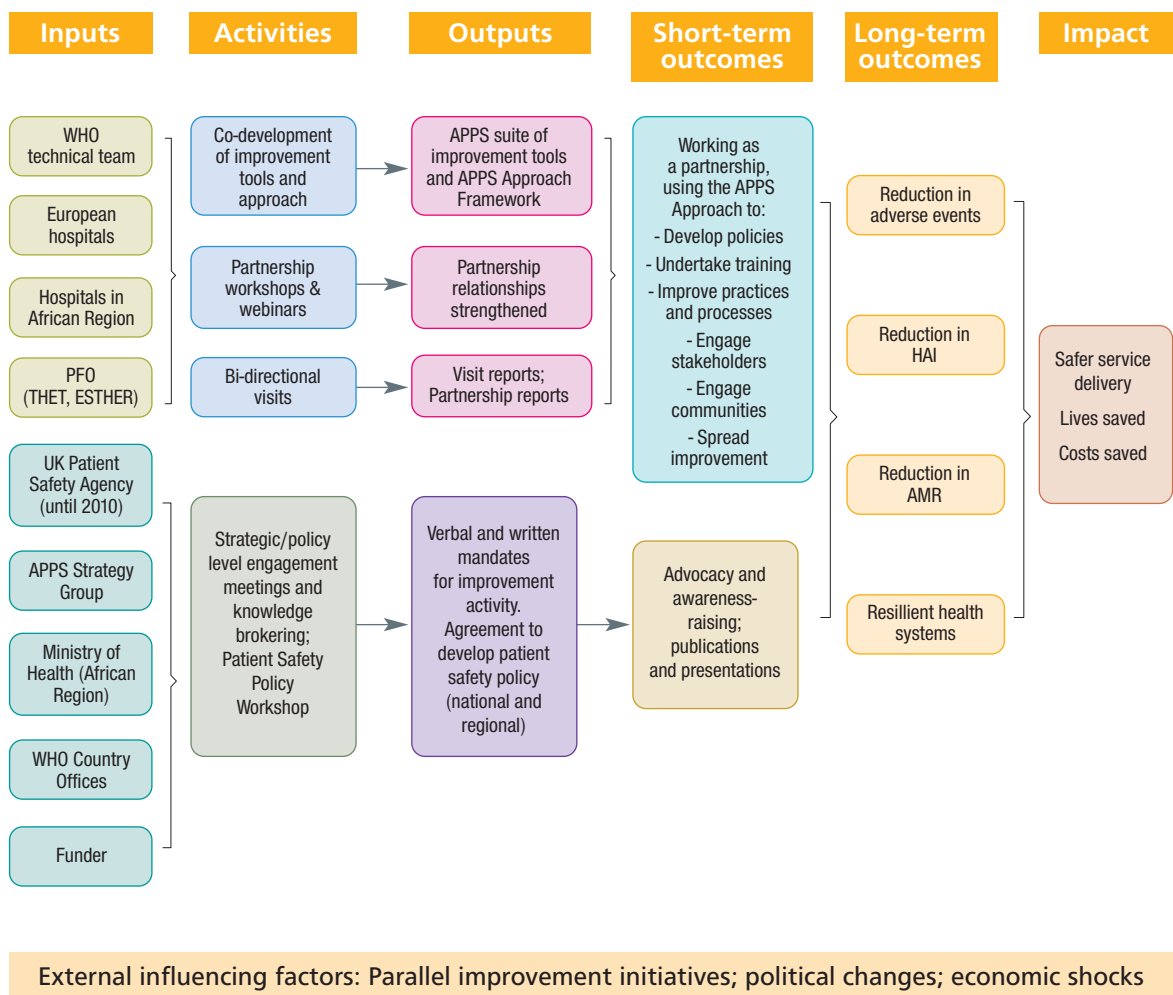| **Summary findings**	• Patient safety understanding on the front line is important • Attention is required to basic infrastructure issues at the same time as patient safety interventions • Working in partnership is crucial	• Create and scale up an active web-based network of patient safety partnerships to support technical improvement and facilitate sustainability • Build on and strengthen existing stakeholder engagement and collaboration (e.g. THET, ESTHER, IAPO, PFPS and POPS) in support of capacity-building
Accessibility	http://apps.who.int/iris/bitstream/10665/78043/1/WHO_IER_PSP_2012.7_eng.pdf?ua=1	http://www.who.int/patientsafety/implementation/apps/events/evaluation-briefing-apps.pdf?ua=1

ANNEX 4
APPS THEORY OF CHANGE

Inputs	Activities	Outputs	Short-term outcomes	Long-term outcomes	Impact

Inputs:
- WHO technical team
- European hospitals
- Hospitals in African Region
- PFO (THET, ESTHER)
- UK Patient Safety Agency (until 2010)
- APPS Strategy Group
- Ministry of Health (African Region)
- WHO Country Offices
- Funder

Activities:
- Co-development of improvement tools and approach
- Partnership workshops & webinars
- Bi-directional visits
- Strategic/policy level engagement meetings and knowledge brokering; Patient Safety Policy Workshop

Outputs:
- APPS suite of improvement tools and APPS Approach Framework
- Partnership relationships strengthened
- Visit reports; Partnership reports
- Verbal and written mandates for improvement activity. Agreement to develop patient safety policy (national and regional)

Short-term outcomes:
- Working as a partnership, using the APPS Approach to:
  - Develop policies
  - Undertake training
  - Improve practices and processes
  - Engage stakeholders
  - Engage communities
  - Spread improvement
- Advocacy and awareness-raising; publications and presentations

Long-term outcomes:
- Reduction in adverse events
- Reduction in HAI
- Reduction in AMR
- Resilient health systems

Impact:
- Safer service delivery
- Lives saved
- Costs saved

External influencing factors: Parallel improvement initiatives; political changes; economic shocks

ANNEX 5
APPS TIMELINE

2008   **2009**   **2010**   **2011**   **2012**   **2013**   **2014**

RC 58 – Ministerial mandate for action on patient safety, September, Yaoundé

First Wave Partnerships launched, October, Kampala

Patient safety curriculum guide for medical schools: pilot, Ethiopia

WHO Patients for Patient Safety advocacy workshop, March, Entebbe

Developed-developing country partnerships: Benefits to developed countries? published, Globalization and Health, June

Symposium on Patient Safety Partnerships, UK, February

APPS Evaluation Briefing Report issued, January

Partnership Learning Symposium, Harare, May

Stakeholder engagement with nine country delegations at WHA 67, May

First patient safety consultation, WHO/AFRO, January, Brazzaville

Health system strengthening Current trends and challenges – references "twinning", WHO World Health Assembly, April

First open access APPS webinar series launched, August

ABHR Training Workshop in Harare, March

National Patient Safety Policy and Strategic Planning Workshop, Harare, September

APPS: A vehicle for enhancing patient safety across two continents published, World Hospitals and Health Services

Second Wave Partnerships launched, WHO Geneva, November

Reverse innovation in global health systems: learning from low-income countries – series published, Globalization and Health, August

Strengthening the evidence-policy interface for patient safety: enhancing global health through hospital partnerships, published, Globalization and Health

Second open access APPS webinar series launched, October

APPS Strategy 2012-2015, launched, December

Technical Session on Patient Safety at WHA 65, May

Progress report on patient safety in the African Region WHA 66, May

ANNEX 6
FOCAL ACTION AREAS

	Health-care associated infection	Safe surgery	Health care worker protection	Waste management
Partnership				
St George's Healthcare NHS Trust (London, United Kingdom) - Komfo Anokye Teaching Hospital, Kumasi (Ghana)	√	√		√
Ipswich Hospital NHS Trust (United Kingdom) - Beira Central Hospital (Mozambique)	√	√		√
Imperial College Healthcare NHS Trust (London, United Kingdom) - Butare Teaching Hospital (Rwanda)	√	√		
North Cumbria University Hospitals NHS Trust (United Kingdom) - Mbeya Referral Hospital (Tanzania)	√	√		√
Guy's & St Thomas' NHS Foundation Trust (London, United Kingdom) - Ndola Central Hospital (Zambia)	√	√	√	

ANNEX 7
GLOBAL CATALYST GROUP FOR INSTITUTIONAL HEALTH

Global Catalyst Group
for
Institutional Health Partnerships

Position Statement

MARCH 2014

The Global Catalyst Group for Institutional Health Partnerships provides a "bridge" between multiple organizations across the world experienced in the partnership based approach to improvement.

The overall purpose of the group is to promote the utility of institutional health partnerships in strengthening health systems and in delivering effective health services through resources, positions statements and collaborative activities.

APPS
African Partnerships for Patient Safety

American College of Healthcare Executives
for leaders who care®

International Hospital Federation

THE EUROPEAN ESTHER ALLIANCE

THET
PARTNERSHIPS FOR GLOBAL HEALTH

The full position statement is available at:
http://www.who.int/patientsafety/implementation/apps/global-catalyst-group.pdf

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