

The international impact of the Brazilian Family Health Strategy in Angola, Belgium, South Africa, and the United Kingdom

O impacto internacional da Estratégia Saúde da Família brasileira em Angola, Bélgica, África do Sul e Reino Unido

El impacto de la Estrategia de Salud de la Familia de Brasil en Angola, Bélgica, Sudáfrica y el Reino Unido

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Abstract *The objective of this study was to assess the international impact of Brazil's Family Health Strategy (FHS) through case studies focusing on four countries that adopted elements of the FHS to improve aspects of their own health systems. Cases were solicited from Angola, Belgium, South Africa and the UK and analyzed through a comparative case study methodology. Results show that each country adopted slightly different aspects of the FHS, with a common element being the role of community health workers (CHW) as a means to extend care to the community and, in the case of Angola and South Africa, to supplement the short supply of health workers. Each country team had familiarity with the FHS through literature, personal contacts, direct experience or observation, and partnerships. While each case is at a different level of maturity, with the Angolan and South African teams at a more advanced stage, all faced a set of common challenges in adapting and implementing elements of the FHS, including the lack of formal job categories for CHWs, a tension between more restricted and more comprehensive roles of the CHW, challenges recruiting and integrating CHWs into healthcare teams, and barriers to scaling initiatives up to achieve results at scale.*

Key words Primary Health Care, Family Health Strategy, Comparative case study, Diffusion of innovation

Resumo *O objetivo deste estudo foi avaliar o impacto internacional da Estratégia Saúde da Família (ESF) do Brasil por meio de estudos de caso com foco em quatro países que adotaram elementos da ESF para melhorar aspectos de seus próprios sistemas de saúde. Os casos foram solicitados de Angola, Bélgica, África do Sul e Reino Unido e analisados por meio de uma metodologia de estudo de caso comparativo. Os resultados mostram que cada país adotou aspectos ligeiramente diferentes da ESF, com um elemento comum sendo o papel dos agentes comunitários de saúde (ACS) como um meio de estender o atendimento à comunidade e, nos casos de Angola e da África do Sul, para suplementar a escassez de profissionais de saúde. Em cada país, pesquisadores tinham familiaridade com a ESF por meio da literatura, contatos pessoais, experiência direta ou observação e parcerias. Embora cada caso esteja em um nível diferente de maturidade, com as equipes angolana e sul-africana em um estágio mais avançado, todas enfrentaram um conjunto de desafios comuns na adaptação e implementação de elementos da ESF, incluindo a falta de categorias formais de trabalho para ACS, uma tensão entre papéis mais restritos e mais abrangentes do ACS, desafios no recrutamento e integração de ACS em equipes de saúde e barreiras para escalar iniciativas para atingir resultados em escala.*

Palavras-chave Atenção Primária à Saúde, Estratégia de Saúde da Família, Estudo de caso comparativo, Difusão da inovação

Resumen *El objetivo de este estudio fue evaluar el impacto internacional de la Estrategia de Salud Familiar (ESF) de Brasil mediante estudios de caso centrados en cuatro países que adoptaron elementos de la ESF para mejorar aspectos de sus propios sistemas de salud. Se solicitaron casos de Angola, Bélgica, Sudáfrica y el Reino Unido, y se analizaron mediante una metodología comparativa de estudios de caso. Los resultados muestran que cada país adoptó aspectos ligeramente diferentes de la ESF, con un elemento común: el rol de los agentes de salud comunitarios (PSC) como medio para extender la atención a la comunidad y, en el caso de Angola y Sudáfrica, para complementar la escasez de profesionales de la salud. En cada país, investigadores estaban familiarizados con la ESF a través de literatura, contactos personales, experiencia directa u observación, y colaboraciones. Si bien cada caso presenta un nivel de madurez diferente, con los equipos angoleño y sudafricano en una etapa más avanzada, todos enfrentaron desafíos comunes en la adaptación e implementación de elementos del ESF, incluyendo la falta de categorías laborales formales para los trabajadores de salud comunitarios, la tensión entre las funciones más restringidas y las más integrales de los trabajadores de salud comunitarios, las dificultades para reclutar e integrar a los trabajadores de salud comunitarios en los equipos de atención médica, y las barreras para ampliar las iniciativas y lograr resultados a gran escala.*

Palabras clave Atención Primaria de Salud, Estrategia de Salud Familiar, Estudio de caso comparativo, Difusión de la innovación

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Introduction

Brazil's Family Health Strategy has origins in community-based primary health care dating to, at least, the early 1970s^{1,2}. Originally piloted as a program employing Community Health Agents (known as *Programa Agentes Comunitários de Saúde* or PACS in Portuguese), its focus was initially addressing persistently high maternal and child mortality and morbidity in the Northeastern state of Ceará³⁻⁵. In order to enhance the ability of this model of care to resolve a greater number of even more complex health problems, it began to encompass integrated health teams with a physician and nurse along with the community health agents and was given the name the Family Health Program (FHP) in the 1990s⁶.

The model continued to develop and incorporated theories regarding the nature and functions of PHC when in 2002, the National School of Public Health translated Barbara Starfield's book *Primary Care: Balancing Health Needs, Services, and Technology*⁷ into Portuguese and distributed copies to all health teams in the country. Researchers also adapted and applied Starfield's Primary Care Assessment Tools (PCAT) in monitoring and evaluation efforts⁸⁻¹⁰. To facilitate their use, the adult PCAT tools were translated and published by the Brazilian Ministry of Health in 2010¹¹ and a short version of the tool was incorporated into the 2015 Vigitel telephone-based surveillance survey¹² and 2019 National Health Survey^{13,14}.

After subsequent refinements, establishment of payment and incentive mechanisms, and rapid scaling up, the FHP became seen as the main primary health care model for municipal health services in much of the country³. In recognition of its key role as a highly effective primary health care approach, the Family Health Program was renamed the Family Health Strategy (FHS) in 2006 to reflect the fact that it was no longer a special program, but a fundamental strategy that placed PHC at the heart of the Brazilian Unified Health System (SUS) which had been enshrined in the 1988 constitution as a duty of the government to provide universal healthcare to all its citizens⁶. The essential characteristics and functions of the FHS were formalized that same year through the country's first National Primary Care Policy (PNAB)¹⁵.

The establishment, impact, and scaling up the FHS is a remarkable success story in global health. Over the past thirty years, it has grown to include 52,000 teams covering over 70% of the population. An important element supporting

this process has been the generation of strong evidence that the FHS was effective in improving access¹⁶, health outcomes¹⁷⁻²³, equity²⁴⁻²⁶, and reducing the need for some hospitalizations²⁷⁻²⁹. While there is still room for continued improvement and expansion into some areas, in particular wealthier urban centers and remote parts of the Amazon, the FHS has been shown to be a robust, resilient, effective, and equitable approach to providing primary health care to the diverse realities across Brazil³⁰.

Important to the spread of this innovation was literature describing and evaluating the impact of the FHS, not just for Brazil, but also for international audiences. This work served to disseminate important details regarding the technical and organizational aspects of the FHS with health professionals, researchers and political decision-makers in different parts of the world³¹⁻³³. Most notably, the FHS has been highlighted as an important case study in highly influential reports from international organizations. These include the 2008 World Health Report on primary health care³⁴, an influential case study published by the Commonwealth Fund in 2016³⁵, materials for the Astana meeting on renewing Primary Health Care in 2018³⁶, and the 2024 WHO primer on Primary Health Care, among others³⁷. Numerous international conferences as well as collaborative agreements between the Brazilian government, Brazilian universities and several other countries provided additional opportunities for knowledge of the FHS to spread to other countries and contexts.

This article analyses the influence that the FHS has had in strengthening primary health care policy internationally, through case examples of ongoing primary health care initiatives in Angola, Belgium South Africa, and the United Kingdom.

Methods

This article is based on a comparative case study approach using best practice observation methods³⁸. This review identified four diverse countries where the FHS has inspired pilot projects or larger-scale initiatives. Given the lack of published evaluative data on these emerging projects, part of the rigor of this approach stems from being able to solicit information about the cases from experts with extensive knowledge of each case.

The process for identifying case studies stemmed primarily from networks of existing

collaborators who had been instrumental in sharing knowledge and experience from the FHS to other contexts. Case studies were developed collaboratively by identifying key elements to guide the writing of the cases. Because expert knowledge is essential to the production of accurate case reports, we briefly describe the qualifying characteristics of each case study author below.

For the Angolan case study, Camila Giugliani's qualifications include being a Brazilian physician, specialist in Family and Community Medicine, PhD in Epidemiology and professor at the Federal University of Rio Grande do Sul (UFRGS). She led the project "Developing Primary Health Care in Angola: A proposal for the assessment of the Community Health Workers Program" and worked as a medical coordinator with *Médecins du Monde* in Angola.

For the Belgian case study, Caroline Masquillier (CM) and Edwin Wouters (EW) have conducted research in South Africa on Community Health Workers (CHWs) providing support for people living with HIV for over a decade. As a health system researcher, EW has extensive experience in developing testing and evaluating health system innovations with a particular focus on access to quality care. CM produced a documentary on the work of CHWs in South African townships and contributed to the development of the first Federal CHW program in Belgium and serves as the scientific expert on Belgium's Steering Committee of the Federal CHW program.

Katrina de Wet is a South African Medical Sociologist working with lay health workers since the early 2000s. She has published on the evolution of this cadre of health workers, attended workshops in the early 2010s to map out the functions of these workers, and did a 2021-2023 study on CHWs in three districts in the Free State province, South Africa.

Matthew Harris is a British doctor who requalified in medicine through the University of São Paulo in 1999 and worked in a Family Health Strategy clinic in Camaragibe, in the northeastern state Pernambuco for four years, completing a specialization in primary care through National School of Public Health, Recife, Brazil. He was the former lead for the Brazil-UK Ministerial technical cooperation (2010-2012) and now leads the national scaling of the Community Health and Wellbeing Worker (CHWW) initiative in the UK in partnership with the National Association of Primary Care. Cornelia Junghans Minton is a practicing GP in

the UK and is the CHWW clinical lead in Westminster and a Public Health specialist with the local authority. With MH, she leads the national scaling of the CHWW initiative in the UK through the National Association of Primary Care.

James Macinko is a health service researcher who has written extensively about Brazil's health system and the FHS for the past 20 years.

Results

Chart 1 shows characteristics of each country included in the study (see Figure 1 in the appendix for a map showing the geographic location of each country). The country cases vary on nearly every dimension. Brazil is the largest in population and land mass and while South Africa and the UK have similar-sized populations, the former has a population density nearly 5 times greater than the latter. In the richest countries (Belgium and UK), health spending (in purchasing power parity-adjusted dollars) is about US\$5400 per capita while in Brazil and South Africa it is about one tenth of this amount and in Angola it is less than 2% of that in the richest countries. Healthcare spending as a proportion of GDP is between 9 and 11% for all countries but Angola (3%), while the government share of this spending varies from a high of 83% in the UK to the lowest of only 45% in Brazil. Despite these differences, Brazil has a universal healthcare coverage index of 80/100, which is close to that of the other countries, with the exception of Angola (37). Health resources also differ considerably, with the UK having the most doctors per capita (35.1/10,000), similar to Belgium, nearly three times the number in Brazil, four times the number in South Africa and 7.5 times the number in Angola³⁹. Health outcomes also vary from life expectancy at birth in the low 80s in UK and Belgium, low 70s in Brazil, and low 60s in South Africa and Angola.

The full case studies are presented in the appendix. A brief summary of each case follows. Spearheaded by UNICEF Angola, and in consultation with experts in Ceará Brazil, where the origins of the Family Health Strategy can be traced, Angola's effort to translate the Brazilian Community Health Worker (like the PACS program) role was inspired by evidence of impact and recognition in the international literature. Technical visits by Luandan health officials and academic cooperation and partnerships were pivotal to this effort. The goal was to accelerate

Chart 1. Description of country contexts, 2019/2020.

	Brazil	UK	Belgium	South Africa	Angola
Population (millions)	211.1	68.3	11.8	63.2	36.8
Geographic size (km ²)	8,515,767	243,610	30,689	1,221,037	1,246,700
Population density per km ²	25	287	383	53	31
GDP/capita, \$US (purchasing power parity adjusted)	10,295	49,464	54,701	6,022	2,308
Health spending per capita (CHE), \$US	849	5367	5405	570	101
GDP spent on health, %	9	11	11	9	3
Government spending on CHE, %	45	83	75	62	52
% of CHE on PHC	n/a	38	36	57	n/a
UHC service coverage index (0-100)	80	88	86	71	37
Healthcare access and quality index (0-100)	53.0	83.3	86.6	44.6	29.3
Doctors per capita	27.0	35.1	32.7	8.3	4.6
Life expectancy at birth	73	82	82	61	62
IMR/1,000 live births	13	4	3	28	46
Hypertension, % adults	45	26.4	30	44.1	38.7

Source: GBD 2019^{39,50}, Global Health Observatory⁵¹.

the reduction of maternal and child mortality through decentralized and accessible interventions, reinforcing the expansion and upgrade of primary health care (PHC) as a fundamental feature.

Beginning in Luanda in 2007, the CHW role (called ADECOS) expanded rapidly to other provinces. This role is closer to that of the PACS model in Brazil because the CHWs are not part of a larger interdisciplinary team, as in the FHS model. In 2014, the Angolan government launched the National ADECOS Program. The pilot program (from 2007-2009) provided training for 2,548 CHWs, covering 261,357 families. Currently there are 4,127 ADECOS and the program is moving towards a consolidated national strategy. ADECOS began with specific focus on MCH, vector-borne diseases, water treatment, and oral rehydration. More recently, ADECOS have been given formal status, paid close to full time, with a more comprehensive health and social care remit, including community development and social protection. Initial evaluation has indicated increased access to care and demand for health services, especially for mothers and children. The pilot has expanded geographically, as well as in terms of the CHW's responsibilities, and now includes additional population groups.

The implementation of a CHW program in Belgium started during the COVID-19 pandemic – which demonstrated CHW's potential in ensuring access to necessary care for people

living in vulnerable contexts⁴⁰. Inspired by these examples of CHW programs abroad, the Belgian Federal Government gave the National Institute for Sickness and Disability Insurance and the National InterMutualist College the task to develop the first nationwide Belgian CHW program to improve access to care: employing 50 CHWs in socio-economically vulnerable neighborhoods in ten Belgian cities⁴¹. However, to date, the Belgian federal CHW program is not structurally linked to the broader health system, while a lack of integration and synchronization between CHW programs and local health systems has been found to create fragmented service delivery and to restrict the effectiveness of CHW programs⁴²⁻⁴⁴.

In response to this need, the Community Health Workers for Primary Healthcare Access (COMPASS) project aims to design, implement and evaluate in what way CHWs can be linked to the primary health care system to improve access to care for people living in socio-economically vulnerable groups in Belgium. This initiative is heavily inspired by the Brazilian FHS (and the South African Re-Engineering PHC program⁴⁵, itself inspired by the Brazilian FHS): expert consultations and field visits in Brazil, including informal conversations with policymakers and health professionals at three PHC clinics in Rio de Janeiro and four PHC clinics in Brasília helped to deepen understanding of the mechanisms and contextual factors influencing the CHW role, with the goal of in-

forming their adaptation to the Belgian context. Several co-creation sessions with people living in socio-economically vulnerable circumstances and GPs in Belgium helped to adapt the lessons learned on FHS to the Belgian context. The current approach is through a four-year cluster-randomized controlled trial implemented in 18 general practitioner (GP) practices in Antwerp, evaluating how CHWs can be linked to the primary health care system to improve access to care for people living in socio-economically vulnerable conditions. Compared to usual care, the intervention involves CHWs linked to GP practices that offer a comprehensive package of support to persons living in socio-economically vulnerable circumstances during home visits. Lay members of the community who provide culturally-sensitive support, through trusted relationships and community connection, motivate patients to seek and access healthcare, and to help them navigate the PHC system. Early evidence suggests CHWs are empowering and making a positive change during patients' initial visits. An international network has facilitated global learning however GP practice recruitment was challenging.

The South African initiative to adopt and adapt the Brazilian CHW role began in 2010 after a visit to Brazil by the then Minister of Health, Dr Aaron Motsoaledi and the provincial Members of the Executive Council (MECs) for health. Initially, the proposition was for Ward-based Primary Health Care Outreach Teams (WBPHCOT) composed of 6-10 CHWs covering around 6000 households to ensure more equitable health outcomes, particularly around maternal and child mortality, HIV/AIDS, TB and other communicable diseases, and to strengthen the overall health system. Since the adoption of the program in 2011, a first National skills audit of Community Health Workers (CHWs) and Outreach Team Leaders (OTLs) took place in 2023. In this audit, the number of CHWs stood at 42 323 CHWs and 2 234 OTLs in eight of South Africa's nine provinces. As in Brazil, CHWs receive detailed and intensive training, but in South Africa they receive an Occupational Health Promotion certificate. The establishment of the National Union of Care Workers of South Africa in 2016 has given the cadre job security and recognition.

Adoption of the Brazilian CHW role in the UK (called Community Health and Wellbeing Workers, CHWWs) has developed slowly over a twenty-year period, beginning with in-depth personal experiences of the FHS over many

years. Despite a series of unsuccessful attempts to pilot the Community Health Worker role or gain policy traction, multiple research and advocacy publications were produced during 2010 and 2020, and it was the COVID-19 pandemic that lent renewed emphasis on the opportunity to focus on community-centered initiatives. Studies of national impact in Brazil were very influential along with continued advocacy by key local champions in the UK. Pilot programs have emerged in several localities since 2021. A bidirectional partnership with FIOCRUZ emerged in 2023 further strengthening the campaign. CHWWs fill a much-needed gap around ensuring continuity of care at the household level and provide a preferred point of contact for residents' needs to enable conversations around their care and proactively identify problems, in order to reduce need for formal services. Over 27 localities across England have, or are in process of implementing, CHWWs in varying numbers with the largest sites in Cornwall and Westminster, in London. Some sites are successfully maintaining, others have been unable to secure continued funding. Overall, the national picture is of growth in number of CHWWs and awareness of the initiative, including visibility and recognition in several key national policy reports^{46,47}. Lay community members are recruited and paid to work full-time in small geographies of 100-150 households, integrated into primary care and wider social care system, with a comprehensive remit to address any and all problems in all households in a given area. A strong social franchise approach, led by the National Association of Primary Care, has taken to scale the CHWW role across many localities, with well codified guidance around the CHWW role⁴⁸. However, there is no national policy or program yet supporting CHWWs.

Chart 2 summarizes results from the four country cases studies. The chart shows that each case has adapted only certain elements of the FHS to meet different needs. For example, the Angolan approach is meant to accelerate the reduction of maternal and child mortality, the Belgium initiative focuses on enhancing access to healthcare, South Africa's has the overriding objective to reduce health inequities, and the UK focuses on more appropriate use of formal health services and uptake of preventive services. In each case, the main element adopted was that of the Community Health Worker, rather than the entire ESF team.

The table also presents variations in how each case developed and expanded. The Ango-

Chart 2. Comparison of case studies.

	Angola	Belgium	South Africa	UK
Objective	To accelerate the reduction of maternal and child mortality through decentralized and accessible interventions, reinforcing the expansion and upgrade of primary health care (PHC) as a fundamental feature.	To design, implement and evaluate how CHWs can be linked to the primary health care system to improve access to care for people living in socio-economically vulnerable groups in Belgium.	Ward-based Primary Health Care Outreach Team (WBPHCOT) ensures more equitable health outcomes , including maternal and child mortality, HIV/ AIDS, TB and other communicable diseases, and to strengthen the overall health system.	Existing community roles unable to ensure continuity of care at the household level. Provides a preferred point of contact for residents' needs to enable conversations around their care and proactively identify problems, in order to reduce need for formal services .
Population covered	The estimated coverage is 412,700 families/ households across the country.	46 CHWs in 10 cities registered a total of 8313 people and provided 14,574 interventions.	46,672 Community Health Workers visited 17.9 million households in 2023/4.	170 CHWWs are in 15 sites that cover approximately 21,000 households or about 50,000 people in total.
Initiative stage (pilot, trial, other)	Beginning in Luanda in 2007, the CHW role (ADECOS) expanded to other provinces. In 2014, the Angolan government launched the National ADECOS Program, funded by the Government and external aid. Currently there are 4,127 ADECOS moving towards a consolidated national strategy.	Currently a cluster-randomized controlled trial implemented in 18 general practitioner (GP) practices in Antwerp. Compared to usual care (control), the intervention involves CHWs linked to GP practices that offer a comprehensive package of support to persons living in socio-economically vulnerable circumstances during home visits.	Since the adoption of the program in 2011, a first "National skills audit of Community Health Workers (CHWs) and Outreach Team Leaders (OTLs) employed by the NdoH" took place in 2023. In this audit, the number of CHWs stood at 42 323 CHWs and 2 234 OTLs in eight of South Africa's nine provinces	Over 27 localities across England have, or are in process of implementing, CHWWs in varying numbers. Some sites successfully maintaining, others have been unable to secure continued funding. Overall national picture is of growth in number of CHWWs and awareness of the initiative.
Specific intervention(s)	ADECOS began with specific focus on MCH, vector-borne diseases, water treatment, and oral rehydration. Recently, ADECOS given formal status, paid close to full time, with more comprehensive health and social care remit, including community development and social protection.	Lay members of the community who provide culturally-sensitive support, through trusted relationships and community connection, motivate patients to seek and access healthcare, and to help them navigate the PHC system	The team composition of WBPHCOTs was approved as six to ten community CHWs, one data capturer, and one Outreach Team Leader (usually a nurse).	Lay community members recruited and paid to work full-time in small geographies of 100-150 households, integrated into primary care and wider social care system, with a comprehensive remit to address any and all problems in all households in a given area.

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lan and South African approaches are both closer to the Brazilian model in the sense that these are initiatives at the national level that have been under development for over a decade. Belgium

is perhaps the smallest in scale because it is still in the piloting stages, while the UK represents the stage of scaling up a successful pilot but is not yet a nationally-supported program.

Chart 2. Comparison of case studies.

	Angola	Belgium	South Africa	UK
How did FHS inspire it?	Spearheaded by UNICEF Angola, consultation with experts in Ceará, and inspired by evidence of impact and recognition in international literature. Technical visits by Luanda-based health officials and academic cooperation and partnerships with Brazil.	During co-creation sessions with people living in socio-economically vulnerable circumstances and GPs in Belgium, we adapted the lessons we learned on FHS and Re-engineering PHC from the fieldwork in South Africa and field visits from Brazil to the Belgian context.	This approach came to fruition after a 2010 visit to Brazil by the then Minister of Health, Dr Aaron Motsoaledi and the provincial MECs for health.	In-depth personal experience of the FHS over many years. Studies of national impact in Brazil were very influential. Established MoUs with FIOCRUZ and visits to local health centers in Brazil amplified the campaign.
Successes	Initial evaluation indicated increased access to care and demand for health services, especially for mothers and children. The pilot has expanded geographically, in the CHW's responsibilities, and now includes additional population groups.	A solid co-creation process with all stakeholders ensured suitability and feasibility and collaboration; early evidence suggests CHWs are empowering and making a positive change during patients' initial visits. Established an international network to facilitate global learning.	Detailed and intensive CHW training followed by an Occupational Health Promotion certificate. The establishment of the National Union of Care Workers of South Africa in 2016 has given the cadre job security and recognition.	Strong social franchise approach has taken to scale the CHWW role across many localities, with well codified guidance around the CHWW role. Research infrastructure has permitted flexibility to support rollout without specific research funding available.
Challenges	CHWs were not supported by a solid health system; health centers were fragile in structure; there was no consistent health policy for including CHWs with sustainable financial resources. Late payments, lack of a formal contract, lack of support, low morale, lack of data.	GP practice recruitment was challenging, unable to recruit CHWs from the communities surrounding the GP practices. This is a four-year research project so funding is temporary	CHW numbers vary across districts and by supervisor posing problems to productivity, supervision and mentoring. Lack of effective referrals and reporting. WBPHCOTs often function under difficult and dangerous working conditions.	Highly fragmented funding and delivery systems and varied political support makes the CHWW role, which cuts across health and social care, challenging to implement and expand.

Source: Authors.

While each case was inspired by the FHS and most teams had contact with Brazilian institutions, including field visits to different parts of the country, the specific elements of the FHS that have been adopted are also varied by each location, perhaps reflecting the differences in the overall objective of each initiative.

Challenges also vary across cases. In Angola, the main challenges have been that the CHWs are not well supported by a solid health system and health centers are fragile in struc-

ture. In addition, there has been no consistent health policy for including CHWs with sustainable financial resources. Late payments, lack of a formal contract, lack of support, low morale, lack of data all impede the potential impact the approach can have on improving population health. In Belgium some of the main challenges involved setting up and performing the study trial, such as an inability to recruit CHWs from the communities surrounding the participating GP practices. In South Africa, challenges in-

clude that CHW numbers vary across districts and by supervisor posing problems to productivity, supervision and mentoring. The system suffers from a lack of effective referrals and reporting and WBPHCOTs often function under difficult and dangerous working conditions. In the UK, the model faces challenges given the highly fragmented funding and delivery systems and varied political support makes the CHWW role, which cuts across health and social care, challenging to implement and expand.

Chart 3 shows key features of the Family Health Strategy adopted by these four coun-

tries: mainly the CHW role. Brazil, uniquely, deploys CHWs across defined, small geographies of households, with a mandate to visit each household at least once per month, and more frequently according to need. Brazilian CHWs do not focus only on specific ages, or conditions, but have a broad health promotion, supportive role across any area of health and social care. They are principally problem-solvers with a strong and enduring connection to the community they work in, mostly resident in that community and paid full-time to fulfill their mandate. Integrated fully into the local

Chart 3. Comparison of CHW roles.

Characteristics	Angola	Belgium	South Africa	UK
Comprehensive Do CHWs support their assigned (note how they are assigned) patients continuously throughout their lives? Are the services they provide comprehensive or more limited? If more limited, what areas do they concentrate on?	Initially, CHWs had a more limited focus on MCH but has since expanded in scope and tasks. ADECOS cover all ages, and have an increasingly important social role, such as supporting community development, mobilizing local leaders, and making the connections between the identified needs and the health and social services available, including cash transfer programs.	In the COMPASS study, CHW models from Brazil and South Africa were adapted to the Belgian context through a co-creation process. Through monthly home visits or contact moments, CHWs build trust with individual clients, gain insight into their health situations, health goals, and barriers. CHWs address these barriers, enabling individuals to gain more control over their health in the long term.	While CHWs are supposed to provide community outreach services, preventive, promotive, curative, rehabilitative and palliative services, this role has evolved from vertical and disease specific (especially HIV and TB) activities and a more comprehensive approach can be challenging to achieve.	CHWs cover all aspects of health and social care across the life course, without restriction or targeting. This includes health promotion, signposting to services, supporting behavior change, early identification of illness, and promoting uptake of preventive services. Their role integrates health and social care issues and takes a whole-household approach.
Hyperlocal Do CHWs have a strong and enduring connection to the community they serve? Are they recruited from the same community? Do they live within easy reach of the households they are responsible for? Are they paid for the work? Is it full or part time work?	CHWs are recruited locally, live in the same community (micro-area) where they work, speak the local language (besides Portuguese), have good relationships community, as well as with traditional leaders, health workers, and local managers. They are paid to work 32 hours per week, but it is common that CHWs have other jobs to increase their income.	CHWs are employed at 80% of the time and receive a salary. CHWs were selected based on familiarity with vulnerable neighborhoods in the Antwerp metropolitan area, proficiency in local languages, strong communication skills (managing difficult or emotional conversations, handling sensitive information confidentially), and an understanding of local healthcare challenges.	CHWs are recruited from their communities and visit residents within walking distance from the facility. CHWs are paid a monthly stipend, which varies according to province and clinic, and has been precarious particularly during annual contract renewal. CHWs are expected to work half a day each day but often end up working longer hours, to accommodate for long distances between households.	CHWs are recruited locally, however, some CHWs live up to 30 mins travel to the neighborhood they work in. CHWs are paid, and generally fulltime, but some areas have created job-share solutions. In London, it can take 11 door knocks to engage with the resident and it takes around one year for CHWs to reach all their households and create an enduring relationship with them.

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primary care team, they can refer to the clinic and participate fully in day-to-day primary care activities. These features have been synthesized by Younan *et al.*⁴⁹ as being Comprehensive, Hyperlocal, Universal and Integrated. The presence of all four features is critical to the CHW role in Brazil.

In Angola, CHWs had only a limited focus on MCH but this has since expanded in scope and tasks. ADECOS cover all ages, and have an increasingly important social role, such as supporting community development, mobilizing local leaders, and making the connections between the identified needs and the health and social services available, including cash transfer

programs. CHWs are recruited locally, live in the same community (micro-area) where they work, speak the local language (besides Portuguese), have good relationships with the community, as well as with traditional leaders, health workers, and local managers. They are paid to work 32 hours per week, but CHWs often have other jobs to supplement their income. CHWs are responsible for a micro-area with approximately 100 households each, geographically defined, after mapping of the territory. The CHWs visits take place in the home. Every household must be visited at least monthly (routine follow-up visit). More frequent visits should take place as special needs are identified. CHWs are

Chart 3. Comparison of CHW roles.

Characteristics	Angola	Belgium	South Africa	UK
Universal About how many people/families do CHWs look after? How is the population served defined (patient list, geography, other?) Where do visits take place (home, clinic, both, other locations?) How often do CHWs make visits/have contact with patients?	CHWs are responsible for a micro-area with approximately 100 households each, geographically defined, after mapping of the territory. The CHWs visits take place in the home. Every household must be visited at least monthly (routine follow-up visit). More frequent visits should take place as special needs are identified.	Each CHW is linked to two GP practices and supports a total of 42 clients once a month. GP teams identify patients in need of additional support. Whenever possible, the CHW will meet clients in their home or an alternative location, such as the GP practice. During each intervention visit, clients are encouraged to invite and, where possible, bring other household members to the next visit.	Each WBPHCOT has around 6-10 CHWs and is responsible for approximately 6,000 individuals (1000 households), although this may vary based on rurality. Regular feedback on the district health information system tracks team activity. CHWs sometimes perform facility-based activities and those on chronic medication are often assisted by CHWs, who deliver prescriptions.	Allocated to neighborhoods of between 100-150 households each and this is geographically defined. In urban areas, CHWWs work within networks of GP practices that cover wider geographies, but only visit residents covered by those practices. Visits mostly take place in the home. Although the mandate is universal, the achievement of this has been gradual and over time.
Integrated Are CHWs an official member of an integrated health team? Is that team involved in primary care only or does it involve other sectors? How well are CHWs able to effectively support the resolution of residents' problems or needs?	CHWs are not officially integrated into a health team, but they make connections between families' needs and the local primary care unit which requires good relationships with health workers. Every CHW has a supervisor, who is sometimes a member of the local health team. Lack of resources and health system weaknesses limit CHWs' impact.	The CHWs are each linked to two GP practices. They are integrated parts of the team, cooperating with other care professionals in the practice and taking part in multi-disciplinary team meetings. We are adopting a learning-by-doing approach to enhance communication, information sharing, and collaboration between CHWs, the GPs and their teams. The RCT is ongoing.	WBPHCOT offer integrated services to households and individuals within their catchment area. More experienced CHWs refer patients to both health and non-health related sectors. WBPHCOTs work with the PHC facility and with non-health services, but there is variability in the level of integration.	CHWWs are an official member of the primary care teams, have NHS emails and ID cards, and can enter information into the electronic patient record but this has been achieved only in some localities. CHWWs are recruited based on their motivation to be problem-solvers for all families, and they generally achieve this well.

Source: Authors.

not officially integrated in a health team, but they are meant to make the connections between the families' needs and the local primary care unit which requires good relationships with the health workers. Each CHW has a supervisor, who sometimes is an official member of the local health team (e.g. as a nurse assistant). Lack of resources e.g. not having a mosquito net or a water treatment pill to deliver, remain significant challenges. The functioning of the wider health care system remains precarious and limits CHW effectiveness.

In Belgium, the intervention arm of the COMPASS cluster-Randomized Controlled Trial (RCT), people living in socio-economically vulnerable circumstances receive comprehensive health-related support from a CHW across the life course, without any specific restriction or targeting by age, clinical condition or ethnicity over the course of twelve months. Through monthly home visits or contact moments, CHWs build trust with their individual clients, gain insight into their health situations, personal health goals, and the barriers they face in achieving these goals. In addition, attention is paid to prevention activities. The CHWs aim to address these barriers, thereby enabling individuals to gain more control over their health in the long term. The CHWs are employed at 80% Full-Time Equivalent (FTE) and receive a salary and were selected based on familiarity with vulnerable neighborhoods in the Antwerp metropolitan area, proficiency in local languages, strong communication skills, and an understanding of the healthcare challenges faced by individuals (gained through interest and/or personal experience). Some CHWs do not reside within close proximity to the households they are assigned to serve. Unlike in Brazil, each CHW is linked to two GP practices furthermore the number of residents supported is smaller than in Brazil (approximately 100 residents each). As this is a research study, the participants need to provide consent to be included in the study.

South African CHWs are supposed to provide community outreach services, preventive, promotive, curative, rehabilitative and palliative services, however, the role has evolved from vertical and disease specific (especially focused on HIV and TB) activities and a more comprehensive approach can be challenging to achieve with little evidence of the frequency/ distribution of this specific service rendered. CHWs are recruited from their communities and visit residents within walking distance from the facility. CHWs are paid a monthly stipend, which varies

according to province and clinic, and has been precarious particularly during annual contract renewal. CHWs are expected to work half a day each day but often end up working longer hours, to accommodate for long distances between households. Each WBPHCOT has around 6-10 CHWs and is responsible for approximately 6 000 individuals or 1000 households, although this can vary based on rurality. Regular feedback on the district health information system (DHIS) ensures a level of monitoring to track team activity. CHWs sometimes get tasked with facility-based activities but regular contact is made with patients, and those on chronic medication are often assisted by CHWs, who deliver their prescriptions. WBPHCOT offer integrated services to households and individuals within their catchment area, the unit being the district health system (DHS) where primary health care is implemented. More experienced CHWs refer patients to a variety of health and non-health related sectors (e.g. to access government grants, a social worker, to apply for IDs, birth or death certificates, etc.). WBPHCOTs work with the primary health care facility (clinic manager, professional nurses, pharmacist, etc.), and with non-health services (social development, Home Affairs, etc.) but there is tremendous variability with regards to degree of integration.

In the UK, CHWWs cover all aspects of health and social care across the life course, without any specific restriction or targeting. This includes health promotion, signposting to services, supporting behavior change, early identification of illness, and promoting uptake of preventative services of any kind. The role is fully comprehensive integrating health and social care issues and taking a whole-household approach. Some additional tasks, e.g. blood pressure monitoring, are being included in some areas. CHWWs are recruited locally, however, some CHWWs live up to 30 mins travel to the neighborhood they work in, particularly in the rural areas such as Cornwall. CHWWs are paid, and generally fulltime, but some areas have created job-share solutions. In London, it can take 11 door knocks to engage with the resident and it takes around one year for CHWWs to reach all their households and create an enduring relationship with them. However, similar to Brazil, CHWWs are allocated to neighborhoods of between 100-150 households each and this is geographically defined. In urban areas, CHWWs work within networks of GP practices that cover wider geographies, but only visit residents registered to those practices. Visits mostly take

place in the home. Although the mandate is universal, the achievement of this has been gradual and over time. CHWWs are integrated into primary care, like in Brazil, and are an official member of the primary care teams, have NHS emails and ID cards, and can enter information into the electronic patient record, but this is not uniformly implemented and has been achieved only in some localities. CHWWs are recruited based on their motivation to be problem-solvers for all families, and irrespective of the level of integration into the wider system, they achieve this well.

Discussion and conclusion

This article identified four different case studies of elements from the Brazilian FHS being adapted to very different healthcare contexts to enhance essential PHC needs. Some key insights can be drawn from this comparative case study approach. In each of these cases, countries adopted only one aspect of the FHS, the Community Health Worker approach. In Belgium and the UK, the CHWs fill a gap in an otherwise well-defined primary care team. In the cases of South Africa and Angola, this decision may have been informed by the lack of other qualified health professionals. The translation of the FHS into these international contexts was driven by personal experience, networks and interministerial collaboration. Local and national champions drive the adoption in the early stages and this can take many years before traction through piloting and then scaling takes place. Reciprocal partnerships have played an important part in many of these trajectories. Each context has had to overcome several challenges, many of which are typical for health service transformation. For example, the system level changes required to incorporate such a far-reaching role are often after-thoughts and under-funded. It can take many months, sometimes even longer, after recruiting a CHW for them to deliver their responsibilities as planned. It can take time for the necessary culture shift from a reactive system to a proactive system based on relationship-building and home visits. As a result, despite best efforts, there can be significant local level variation in the way CHWs are deployed. Creating a national program eventually helps to systematize the role and embed it within the wider health and social care system – something that was very effectively delivered in the early 2000s in Brazil. The role of CHWs

as a bedrock of primary care is not yet fully established in these settings in the same way as it has become in Brazil. It is sometimes viewed as a stepping stone into 'higher' roles rather than a uniquely important role, requiring uniquely important skills, within primary care.

There are many other lessons that can be drawn from Brazil's successful scaling of the CHW role throughout the country. The creation of an effective research agenda and extensive data infrastructure are needed to underpin the evidence and support for scaling. A universal national health service with financial participation of federal, state, and municipal contributions along with financial incentives (such as the fixed and variable per capita payment systems) played an enormous role in helping Brazilian municipalities adopt the FHS approach to primary care. While the UK (national health service) and Belgium (national health insurance) have somewhat different approaches to healthcare financing, each country provides universal coverage with a strong primary care focus. South Africa and Angola, however, are still in the process of developing their national health systems. Despite their differences, in each case study there remains a need to define how community health workers can be sustainably financed, not as a stand-alone program, but as a valued part of a multidisciplinary healthcare team and an integral part of the health system. Incentives and administrative support to expand and integrate CHWs should be considered in national arenas in these four countries.

Constructing a common language, as was achieved through Starfield's work identifying key themes and objectives of primary care and the use of appropriate evaluation instruments, such as the Brazilian adaptation of the Primary Care Assessment Tools, are important to documenting progress and communicating accomplishments as well as challenges. Each case study country will need to build on progress to inform new policy narratives around proactive, relational and community-based care that moves away from a reliance on reactive and transactional medical models. At the same time, flexibility is required so that national programs do not overly bureaucratize or administer the CHW role. In this regard, caution must be taken not to generate data that will not or cannot be used, or to restrict CHW activity through overly burdensome training or credentialing. This is admittedly a difficult balance to achieve.

Ultimately, the deployment of community health workers as comprehensive, hyperlocal,

universal and integrated functions, as defined in the SUS, requires a far-reaching transformation of the system in these contexts, moving from vertically oriented, transactional and reactive systems to a system of relational, communi-

ty-oriented and person-centered healthcare. Based on experiences in Brazil, such a transformation has the power to enhance health outcomes and health equity in each of the case study countries.

Collaborations

J Macinko: conceptualization, writing - original draft preparation. M Harris: conceptualization, writing - original draft preparation, data curation. C Giuliani: Data curation, investigation, writing - reviewing and editing. CJ Minton: data curation, investigation, writing - reviewing and editing. C Masquillier: data curation, investigation, writing - reviewing and editing. K Wet: data curation, investigation, writing - reviewing and editing. E Wouters: data curation, investigation, writing - reviewing and editing.

Data availability statement

The data sources adopted in the research are indicated in the article's body.

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