E-health in low- and middle-income countries: findings from the Center for Health Market Innovations

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Objective To describe how information communication technology (ICT) is being used by programmes that seek to improve private sector health financing and delivery in low- and middle-income countries, including the main uses of the technology and the types of technologies being used.

Methods In-country partners in 16 countries directly searched systematically for innovative health programmes and compiled profiles in the Center for Health Market Innovations' database. These data were supplemented through literature reviews and with self-reported data supplied by the programmes themselves.

Findings In many low- and middle-income countries, ICT is being increasingly employed for different purposes in various health-related areas. Of ICT-enabled health programmes, 42% use it to extend geographic access to health care, 38% to improve data management and 31% to facilitate communication between patients and physicians outside the physician's office. Other purposes include improving diagnosis and treatment (17%), mitigating fraud and abuse (8%) and streamlining financial transactions (4%). The most common devices used in technology-enabled programmes are phones and computers; 71% and 39% of programmes use them, respectively, and the most common applications are voice (34%), software (32%) and text messages (31%). Donors are the primary funders of 47% of ICT-based health programmes.

Conclusion Various types of ICT are being employed by private organizations to address key health system challenges. For successful implementation, however, more sustainable sources of funding, greater support for the adoption of new technologies and better ways of evaluating impact are required.

Abstracts in عربي, 中文, Français, Русский and Español at the end of each article.

Introduction

Health systems in low- and middle-income countries continue to face considerable challenges in providing high-quality, affordable and universally accessible care. In response, policy-makers, donors and programme implementers are searching for innovative approaches to eliminate the geographic and financial barriers to health. This has resulted in mounting interest in the potential of e-health (the use of ICT for health) and m-health (the use of mobile technology for health, a subset of e-health) in low- and middle-income countries.

Developing countries are experiencing an unprecedented increase in the number of users of cell phone and internet technologies, as well as a decline in the price of devices and services.[1–4] As a result, many health programme implementers and policy-makers are exploring the extent to which e- and m-health (henceforth referred to simply as e-health) can help address the challenges faced by resource-constrained health markets in terms of the availability, quality and financing of health care. This increasing interest is evidenced by the growing number of events, web sites and literature focused on e-health, including the Saving Lives at Birth Grand Challenge,[5] the recent *Health Affairs* thematic issue on e-health in the developing world,[6] the m-health summits that took place in Washington, DC, United States of America,[7] and Cape Town,[8] South Africa, and the survey recently conducted by the World Health Organization on the use of m-health by its Member States.[1]

Despite the increased interest – perhaps bordering on excess – in some individual programmes, in low- and middle-income countries the e-health field is still relatively nascent. Few programmes have gone to scale and implementation has typically been fragmented and uncoordinated. To date, the literature on e-health in low- and middle-income countries has largely consisted of articles describing single uses of technology in health care delivery,[9,10] as well as theoretical discussions and recommendations surrounding the implementation of e-health-based programmes and policies,[11,12] with few examinations of the actual global landscape of these programmes. One exception is a white paper commissioned by Advanced Development for Africa that lays out a series of case studies and provides best-practice recommendations from e-health experts.[13] Another paper reviews the evidence on the impact of e-health in low- and middle-income countries.[14] The aforementioned WHO survey of Member States' utilization of m-health[1] presents a systematic landscaping of health programmes; nevertheless, the survey relied on local government knowledge, which is often limited when it comes to the private sector, where much of the e-health activity is taking place.

By analysing health programmes in low- and middle-income countries that engage the private sector, our paper fills gaps in the e-health literature and provides new insight into several central questions. It examines specifically the geographic distribution of technology-enabled programmes, the key issues technology can address in the health sector, and the key challenges posed by the adoption and implementation of technology for health-related purposes.

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Methods

Center for Health Market Innovations

This analysis of the e-health technology landscape (henceforth referred to as ICT or simply technology) relies on information obtained from the Center for Health Market Innovations' (CHMI) database.[15] CHMI, launched in July 2010 and updated daily, systematically collects information on programmes and policies – implemented by a wide variety of public and private actors – that have the potential to improve health systems in low- and middle-income countries, where private providers tend to predominate and household out-of-pocket spending is a major source of health financing. These programmes use innovative delivery and financing mechanisms to improve access to health services, as well as their quality and affordability, for the poor. Examples include private clinical social franchises, vouchers for safe deliveries, high-volume/low-cost maternity hospitals with cross-subsidies for poor patients and government accreditation for private drug shops. Not all CHMI-documented programmes rely on innovative information technologies, but many do.[1]

Traditionally, clinics, hospitals, and public health programmes run by the government or by non-governmental organizations are outside the scope of CHMI and are excluded from this institution's database. Since CHMI focuses on programmes that work primarily with private providers, large-scale government e-health infrastructures, such as national electronic medical record systems, were not included in this analysis. Similarly, the database screens out programmes that serve mainly high-income populations and focuses on programmes targeting the poor or people in a range of income brackets.

CHMI data were obtained through systematic searches for innovative health programmes led by partners in 16 countries chosen for their thriving private sectors: Bangladesh, Bolivia, Brazil, Cambodia, Ecuador, India, Indonesia, Kenya, Pakistan, Peru, the Philippines, Rwanda, South Africa, Uganda, the United Republic of Tanzania and Viet Nam. Direct searches were supplemented by literature reviews and self-reported information obtained from the programmes themselves. As a result, the data were limited to the information captured by contributions to CHMI's database and do not include the full universe of all relevant programmes. Furthermore, CHMI's focus on private care delivery and its relationships with partner organizations in specific countries may have resulted in data collection biases. More information on the data collection methods can be found on CHMI's web site.[16]

At the time of this study, the database included 657 programmes, 176 of which were identified as "technology-enabled", that is, as deliberately using ICT to improve health. The programmes that passed this screening were those driven by technology as a core function, such as health insurance programmes whose client interactions take place entirely through smart-card technologies, or programmes that use technology as part of a broader health strategy, such as clinics offering comprehensive primary care but using cell phones for patient follow-up. Programmes not considered technology-enabled included those that use no form of ICT or do not report it as a key element that enhances their work. Based on this definition, a programme using an X-ray machine alone would not be classified as technology-enabled; however, if the X-ray machine were part of a remote diagnostic service using telemedicine, the programme would be classified as technology-enabled.

Two taxonomies were developed to categorize technology-enabled CHMI programmes: the type of technology used (Box 1) and the purpose of the technology (Box 2). All 176 programmes were coded in accordance with these taxonomies, which were then combined with comparable data collected on all programmes, such as geographic location, health focus (e.g. human immunodeficiency virus [HIV] infection and acquired immunodeficiency syndrome [AIDS], primary care, family planning) and source of funding, to identify emerging patterns in the technology landscape. Further insights were drawn from 20 qualitative interviews with a subset of programme implementers and from anecdotal self-reports on impact obtained from certain programmes.

Our analysis captures the number of programmes using technology, not the scale of technology use, because this information is incomplete. Nevertheless, the limited information on scale does indicate a wide range in programme size. For example, several programmes report reaching hundreds of patients or users,[17] whereas others claim to have reached thousands or more. A case in point is India's government-sponsored *rashtriya swasthya bima yojana* health insurance, which claims to have distributed over 27 million active smart cards to its subscribers.[18]

Box 1. **Technology used, by type of device and use case**

Device

- camera (video/photo)
- computer
- GPS
- PDA or tablet computer
- phones: smartphone, cell phone, landline phone
- radio
- remote/portable diagnostic tool
- smart card
- unique ID (e.g. biometric scanner, RFID)
- other

Use case

- software (e.g. to enable data collection, support clinical decisions, or conduct business intelligence)
- voice (e.g. VoIP, hotline)
- Internet: e-mail, web site, instant messaging
- text messaging (e.g. SMS, MMS)
- videoconference

GPS, global positioning system; MMS, multimedia messaging service; PDA, personal digital assistant; RFID, radio frequency identification; SMS, short message service; VoIP, voice over internet protocol.

Box 2. **Main purposes for which health programmes use information and communication technology**

Extending geographic access: the purpose is to overcome distance between physician and patient by replacing a traditional office visit. It includes what would traditionally be called telemedicine (e.g. videoconferencing with patients in rural areas; helplines; instant messaging with a health practitioner for medical advice).

Facilitating patient communications: the purpose is to facilitate communication between health workers/programmes and patients outside regular office visits. Subcategories include:

- general health education
- encouraging patient compliance
- enabling emergency care
- protecting patient privacy.

Improving diagnosis and treatment: the purpose is to allow a health worker to improve clinical performance during training or in the field through real-time assistance with clinical decision-making and diagnosis.

Improving data management: the purpose is to improve data collection, organization or analysis. It can quicken and enhance data transmission and enable remote data collection (e.g. using personal digital assistants to electronically collect information about certain diseases or the health of children in certain regions; electronic record systems). Subcategories include:

- data collection
- data organization/analysis.

Streamlining financial transactions: the purpose is to expedite financial transactions by making it easier for patients to pay for their care and for the physician to receive the payment (e.g. mobile insurance premium payments, vouchers over the phone).

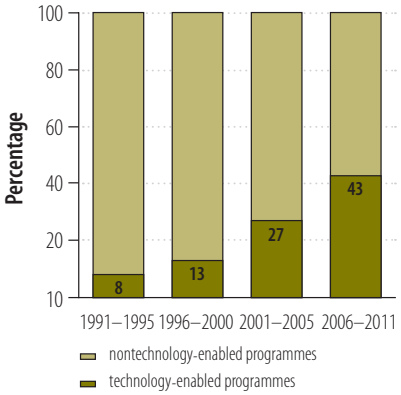
Mitigating fraud and abuse: the purpose is to prevent fraud and abuse (e.g. texts and pin codes to detect counterfeit drugs, using biometric data to confirm that a health worker has actually visited a patient). Subcategories include:

- verifying a medical product
- verifying patient identity
- verifying financial transactions
- tracking human resources/operations.

Other: this includes less frequent categories, such as overcoming language barriers or using technology's appeal to attract more patients and greater attention.

Source: Center for Health Market Innovations.

Fig. 1. **Percentage of programmes currently using information and communications technology, by year launched**



Source: Center for Health Market Innovations.

Results

Programme emergence

At the time of this study, 27% of CHMI-profiled programmes used technology as a core dimension of their work. The analysis by launch date of these 176 technology-enabled programmes (Fig. 1) shows considerable growth in the field of e-health: only 8% of CHMI-profiled programmes launched in the early 1990s are currently using technology, compared with 43% of programmes launched in the last five years.

Technology-enabled programmes are emerging in all lower-income countries, as shown in Fig. 2. Southern Asia – India in particular – leads in terms of the absolute number of technology-enabled programmes, but the percentage of such programmes (out of all CHMI-profiled health programmes) is relatively uniform across regions.

Technology solutions appear to be emerging across all areas of health, with HIV/AIDS, general primary care, and maternal and child health in the lead in terms of absolute numbers. However, ICT is more likely to be adopted in certain areas of health care, as shown in Fig. 3. For example, the majority (65%) of emergency programmes are technology-enabled, whereas only 31% of HIV/AIDS programmes use ICT.

Technology-enabled programmes currently receive funding from a variety of sources (Fig. 4), but 47% of the 176 programmes rely primarily on donors. The government is the main source of funding for 22% of the programmes, and out-of-pocket payments (patient fees), for 25%.

Types of technology solutions

The taxonomy for the type of technology used (Box 1) was developed by coding all programmes on the basis of: (i) the device used (e.g. phone, camera) and (ii) the use case (e.g. videoconference, short messaging service [SMS]). Use case is the way in which the device is applied. Individual devices can link to multiple use cases (e.g. a phone can be used for voice and/or text messaging).

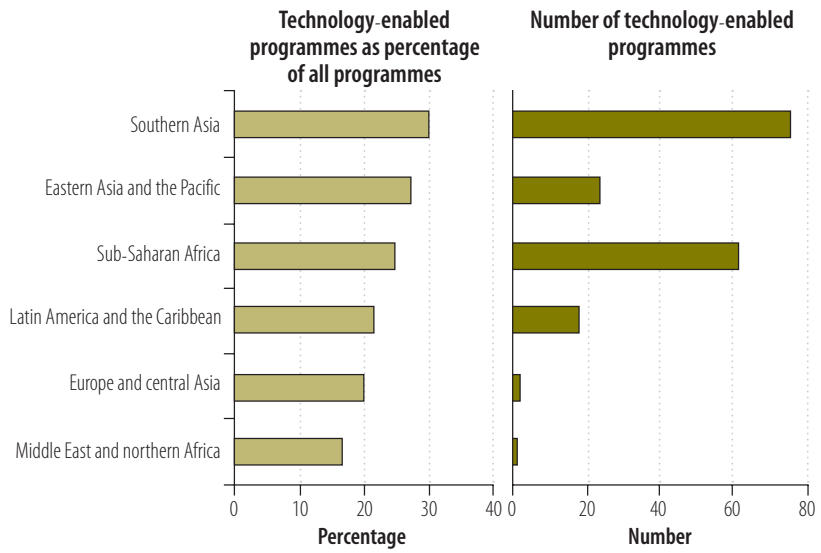
The data revealed that technology programmes rely mainly on phones and computers (71% and 39% of programmes, respectively, as shown in Table 1), and frequently on both. In particular, 63% of the programmes using phones rely exclusively on cell phones for their operations.

Closely tied to the device is the primary use case (Fig. 5). Voice is the most frequent use case for technology devices. Just over 34% of programmes use voice; almost 32% use applications or other software, and approximately 31% use some form of text messaging (SMS).

Purpose behind use of the technology

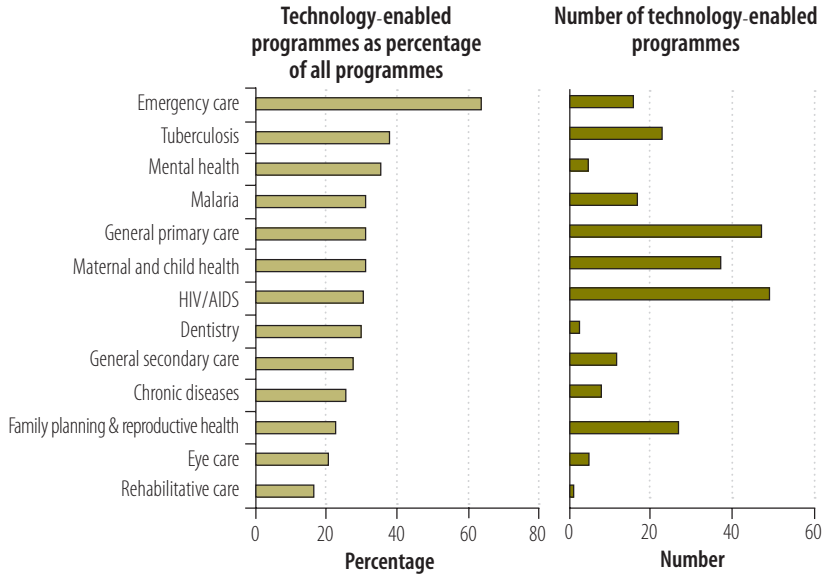
The taxonomy for the purpose behind the use of technology by health programmes (Box 2) was developed through a review of the goals of each technology innovation. Six broad reasons surfaced, the most common one (42% of programmes) being to extend geographic access to health (Fig. 6). Examples range from TeleDoctor in Pakistan, which provides access to physicians through a telephone hotline,[19] to E Health Point in India, which facilitates patient-doctor interactions in rural areas through videoconferencing.[20] The second most common purpose (38% of programmes) behind the use of

Fig. 2. **Technology-enabled programmes, by region**



Source: Center for Health Market Innovations.

Fig. 3. **Technology-enabled programmes, by health focus**



Source: Center for Health Market Innovations.
AIDS, acquired immunodeficiency syndrome; HIV, human immunodeficiency virus.

technology is to improve data management. Within this category, 38% of programmes focus on data collection, 35% on data organization and analysis and 27% on both. For example, Nacer[21] uses telephone and internet technology to allow health workers in Peru to collect data on various populations and share it remotely with medical experts for data analysis. Facilitating patient communications outside regular health visits and improving diagnosis and treatment are the purposes behind technology use in 31% and 17% of the programmes, respectively. In addition, a few programmes use technology to mitigate fraud and abuse and to streamline financial transactions.

Discussion

The use of technology by a large percentage of programmes to extend geographic access to health care is particularly promising given the critical shortage of health workers and poor distribution of service providers in many low- and middle-income countries.[22,23] These programmes often take the form of telemedicine, which connects physicians and patients via technologies such as video chat, or health hotlines, which provide patients with around the clock access to qualified doctors. Interestingly, 70% of the programmes focused on improving diagnosis and treatment also use technology to extend access. These two purposes go hand-in-hand, especially when a programme aims to enable workers with less training to provide high-quality care by using clinical decision-support software to improve the quality and consistency of practice. For example, M-DOK was a pilot mobile health system that allowed rural community health workers in the Philippines to send patient information over text message to specialists in urban areas, who then advised on accurate diagnosis and appropriate treatment.[24]

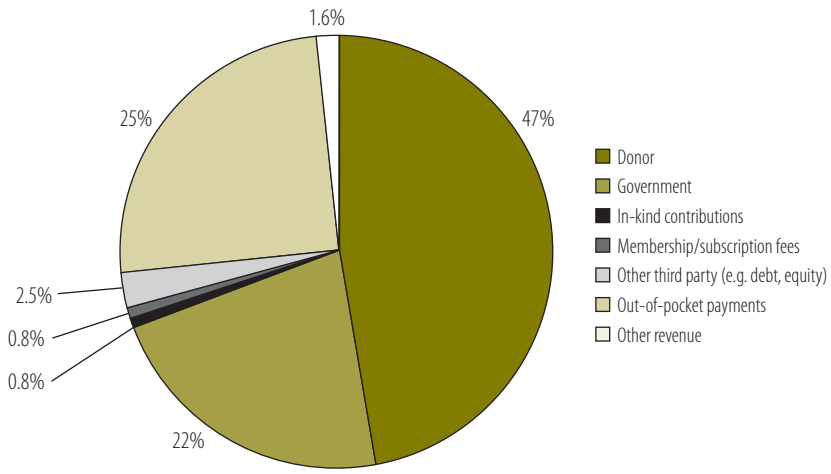
Although mitigating fraud and abuse and streamlining financial transactions are the least common of the identified purposes for technology-use, this may be a major area of opportunity for e-health in the future. Low- and middle-income countries are seeking new solutions to improve oversight and accountability in health transactions. They can reduce the loss of scarce health care resources by monitoring drug purchases and verifying receipt of services before insurance payments are transferred. Mobile payment technologies, such as M-Pesa in East Africa, have become increasingly popular[25] and in all likelihood will continue to be used for streamlining financial transactions in health.

Devices and use case

Anecdotally, many policy-makers and funders seem to be particularly excited about the potential of newer, emergent technologies, such as tablets. Nevertheless, the expansion of mobile infrastructure and the concurrent increase in the use of telecommunication devices among the poor has allowed programmes to utilize existing devices and invest less in new technologies. This study shows that common technologies such as basic cell phones and computers are frequently used.

Interestingly, text messages fall third in the distribution of technology

Fig. 4. **Technology-enabled programmes by primary source of funding**



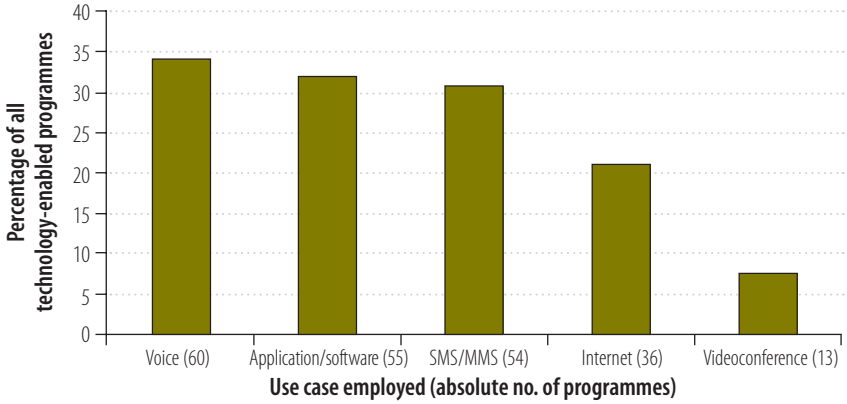
Note: Due to rounding, percentages do not sum to 100. The total is out of 122, as we have subtracted the 54 "unknown" total sources from the total.
Source: Center for Health Market Innovations.

Table 1. **Technology-enabled programmes, by type of device**

Device	Programmes	
	No.	%[a]
Phone	125	71
Computer	68	39
Camera [video/photo]	13	7
PDAs/tablets	11	6
GPS	9	5
Remote diagnostic tool	8	5
Smartcard	6	3
Unique identification	5	3
Radio	5	3
Other	14	8

GPS, global positioning system; PDA, personal digital assistant.
[a] Represents the percentage among all technology-enabled programmes.
Source: Center for Health Market Innovations.

Fig. 5. **Technology-enabled programmes, by use case employed**



MMS, multimedia messaging service; SMS, short message service.
Note: Individual programmes can fall under multiple purposes; as such, percentages do not sum to 100.
Source: Center for Health Market Innovations.

use cases, with voice and software/applications ranking higher, despite the global excitement over SMS.[26,27] Programme implementers have cited greater accessibility for illiterate populations as one of the advantages of voice messages over text messages.

Certain purposes are logically more closely associated with specific devices. This study found that 94% of programmes that facilitate patient communications outside traditional health visits use phones, while only 28% use computers. This is not surprising, since patients in low-income settings are more likely to own phones.

Health focus

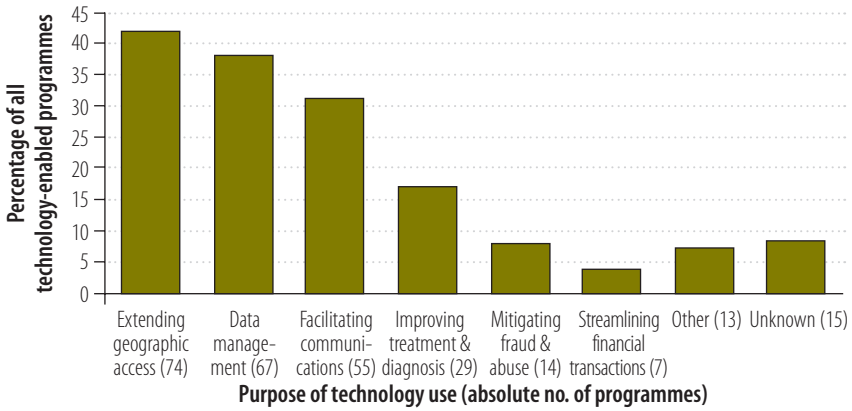
Primary care staff require strong diagnostic skills, while secondary care providers need specialized knowledge about particular diseases and conditions. According to this study, programmes focused on primary and secondary care use technology primarily to extend geographic access to care (57% of general primary care and 75% of general secondary care programmes) and to improve treatment and diagnosis (26% and 67%, respectively). In this way, these programmes are able either to connect underserved patients with specialized and trained physicians or to improve the skills of lesser-trained health workers who are more accessible to the patients.

On the other hand, 43% of HIV/AIDS, 35% of tuberculosis and 33% of family planning and reproductive health programmes that are technology-enabled use technology to facilitate patient communications, which is thus one of their most important aims. This is probably because they require frequent low-level provider-patient interactions to ensure compliance with treatment protocols and impart general education.

Impact

Broadly assessing the impact of ICT programmes on indicators such as service access, quality, cost and efficiency was beyond the scope of this study for lack of the necessary data. However, 16 of the 176 technology-enabled programmes responded to a request for self-reported clear and quantifiable impacts, from improvements in the quality of care to decreased costs. Six programmes described an increase in user satisfaction, the most common impact reported. For example, 92% of the patients using GlicOnLine, which helps diabetics in

Fig. 6. **Technology-enabled programmes, by purpose of use of technology**



Note: Individual programmes can fall under multiple purposes; as such, percentages do not sum to 100.
Source: Center for Health Market Innovations.

Brazil calculate insulin dosages and plan their diet, reported that the system had improved their lifestyle.[28] User satisfaction is a key impact, since acceptance by end users, whether patients or health workers, is a big concern for many e-health implementers. Five programmes reported improvements in the quality of care, often relating to increased patient adherence to the physician's recommendations or to drug regimens. Operation ASHA reports that its system, which uses fingerprint scanners to verify adherence to tuberculosis medication in slums in India, has decreased the fraction of patients who fail to complete treatment from 60% to less than 3%.[29] Four programmes report an impact on efficiency, often in the form of time saved. The e-health community may see an increase in reports of efficiency impacts because it is natural for technology to have such an effect, particularly on account of ICT's ability to transfer data almost instantaneously. For example, the RapidSMS system in Malawi, which collects data on paediatric patients using mobile phones, has reduced transfer times for some data from 1 to 3 months to only 2 minutes.[30] Similarly, decreased costs resulting from technology are reported by few programmes at present,[31] but such reports could rise,[31] especially as savings from increased efficiencies overcome initial capital costs. This small number of self-reported, quantifiable positive results suggests that e-health can have an impact, although more rigorous evaluation is needed.[10]

Barriers to implementation

As programmes look for opportunities to scale up e-health services, they may be hampered by persistent reliance on donor funding (Fig. 4), which highlights the need for an eventual transition to alternative and diversified revenue sources (e.g. government contracts, insurance or direct payments from consumers) to bring effective programmes to scale. In addition, it appears to be more difficult to adapt an existing organization to a given technology than to build an organization with technology from scratch. Fig. 3 suggests that programmes launched before the advent of ICT are not rapidly adopting the new technologies. When this study was conducted, 73% of programmes in CHMI's database were not technology-enabled, and interviews with a selection of implementers suggest that organizations face important barriers to implementation. Implementers have pointed out problems with end-user acceptance of the technology attributable to factors such as the user's lack of familiarity with the technology, a lack of cultural appropriateness or a lack of incentive to adopt new tools. Another key concern is the lack of the necessary infrastructure to provide reliable electricity and internet access. One implementer cited this as a key reason for moving from computers to mobile phones, for which the necessary infrastructure is more readily available. Costs, both initial and ongoing, also surfaced as a key impediment to technology implementation. Such considerations may determine if, when, and how a technology is incorporated into a programme.

Conclusion

ICT is being deployed around the world in many areas of health. Six major reasons for the use of ICT in health have emerged in this paper. Some, such as extending access to care or improving data management, are rather common, but there are budding uses as well, specifically in fields such as mitigating fraud and abuse and streamlining financial transactions. These fields deserve special attention to ensure their proper development. As e-health continues to evolve, many of the current challenges faced by health systems in low- and middle-income countries, such as the shortage of health workers in rural areas, the variable quality of care, lack of patient compliance, and fraud, will potentially be mitigated through the wide deployment of ICT. It will be crucial to continue to track which of these purposes are being successfully fulfilled by technology and what devices and use cases are most effective in attaining them. This will require more systematic evaluations and better codification of lessons learnt from existing programmes, which in turn will allow programmes that are currently struggling to employ technology to make educated decisions about when and how to implement ICT. ■

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ملخص

الصحة الإلكترونية في البلدان منخفضة ومتوسطة الدخل: نتائج من مركز ابتكارات سوق الصحة

الغرض وصف كيفية استخدام تكنولوجيا المعلومات والاتصالات من قِبل البرامج التي تسعى لتحسين تمويل الصحة في القطاع الخاص وإيصاله في البلدان منخفضة ومتوسطة الدخل، بما في ذلك الاستخدامات الرئيسية للتكنولوجيا وأنواع التكنولوجيات التي يجري استخدامها.

الطريقة قام الشركاء داخل البلدان في 16 بلدًا بالبحث مباشرة وبطريقة منهجية عن البرامج الصحية الابتكارية وقاموا بتجميع الصور البيانية في قاعدة بيانات مركز ابتكارات سوق الصحة. وتم دعم هذه البيانات من خلال استعراض ما كتب عن الموضوع والبيانات التي يتم الإفصاح عنها ذاتيًا بواسطة البرامج ذاتها.

النتائج يجري استخدام تكنولوجيا المعلومات والاتصالات بشكل متزايد لأغراض مختلفة في عدد من المجالات المرتبطة بالصحة، في العديد من البلدان منخفضة ومتوسطة الدخل. حيث تستخدم 42 ٪ من برامج الصحة المعتمدة على تكنولوجيا المعلومات والاتصالات هذه الوسيلة بغرض توسيع الوصول الجغرافي إلى الرعاية الصحية وتستخدم 38 ٪ هذه الوسيلة بغرض تحسين إدارة البيانات وتستخدم 31 ٪ هذه الوسيلة بغرض تسهيل التواصل بين المرضى والأطباء خارج عيادات الأطباء. وتتضمن الأغراض الأخرى تحسين التشخيص والعلاج (17 ٪) والحد من الغش وإساءة الاستخدام (8 ٪) وتنشيط المعاملات المالية (4 ٪). وتمثل الهواتف وأجهزة الكمبيوتر الأجهزة الأكثر استخدامًا في البرامج التي تستفيد من تكنولوجيا المعلومات والاتصالات، حيث تستخدمها نسبة 71 ٪ و39 ٪ من البرامج على التوالي، بينما تتمثل التطبيقات الأكثر شيوعًا في التطبيقات الصوتية (34 ٪) والبرمجيات (32 ٪) والرسائل النصية (31 ٪). وتمثل الجهات المانحة جهات التمويل الرئيسية لنسبة 47 ٪ من برامج الصحة المعتمدة على تكنولوجيا المعلومات والاتصالات.

الاستنتاج تستخدم المؤسسات الخاصة أنواعًا عديدة من تكنولوجيا المعلومات والاتصالات بغرض التعامل مع التحديات الرئيسية التي تواجهها النظم الصحية. ولكن، لضمان إنجاح التنفيذ، يتطلب الأمر زيادة مصادر التمويل المستدامة وزيادة الدعم لتبني تكنولوجيات جديدة وتحسين طرق تقييم الأثر.

摘要

中低收入国家的电子卫生:卫生市场创新中心的调查结果

目的 描述旨在提高中低收入国家私营部门的卫生筹资和成果的各个计划使用信息通信技术(ICT)的状况,包括技术的主要用途和正在使用的技术类型。

方法 16 个国家的国内合作伙伴直接、系统地调查创新卫生计划,编制卫生市场创新中心数据库档案。这些数据通过文献综述进行增补,并辅以由计划自身提供的自我报告数据加以完善。

结果 在许多中低收入国家中,各类卫生相关领域越来越多地将 ICT 用于各种用途。在采用 ICT 的卫生计划中,42% 的计划利用 ICT 扩大能够得到医疗保健的地理范围,38% 的计划利用 ICT 改善数据管理,而 31% 的计划利用 ICT 方便病人和医生之间在医生办公室外的沟通。其他的用途包括改善诊断和治疗(17%)、减少欺诈和滥用(8%)和简化财务处理(4%)。在采用技术的计划中,最常见的设备是电话和计算机;使用使用和计算机的计划分别占 71% 和39%,而最常见的应用是语音(34%)、软件(32%)和文本消息(31%)。采用 ICT 的卫生计划中有 47% 主要资金来源是捐助者。

结论 私营机构正在采用各类 ICT 应对卫生系统的重要挑战。然而,成功实施还有赖于更具持续性的资金来源、对采用新技术的更大支持以及对影响进行评价的更好方法。

Résumé

E-santé dans les pays à revenu faible ou moyen: résultats du Center for Health Market Innovations (Centre pour les Innovations du Marché de la Santé)

Objectif Décrire comment les technologies de l'information et de la communication (TIC) sont utilisées par des programmes visant à améliorer le financement du secteur privé dans le domaine de la santé et la prestation de soins de santé livraison dans les pays à revenu faible et moyen, et notamment les principaux usages des technologies et les types de technologie utilisés.

Méthodes Les partenaires locaux de 16 16 pays ont fait des recherches directes et systématiques de programmes de santé innovateurs et ont compilé ces profils dans la base de données du Center for Health Market Innovations. Ces données ont été complétées par relevées dans des revues scientifiques et des données auto déclarée saussi fournies par les programmes eux-mêmes.

Résultats Dans de nombreux pays à revenu faible et moyen, les TIC sont de plus en plus utilisées à des fins différentes dans divers buts et dans divers domaines liés à la santé. Parmi les programmes faisant appel aux utilisant les TIC, 42% les utilisent le font pour étendre géographiquement l'accès aux soins de santé, 38% % pour améliorer la gestion des données, et 31% pour faciliter la communication entre les patients et les médecins en dehors du cabinet médical. D'autres objectifs buts ont été constatés, comme tels que l'amélioration des diagnostics et des traitements (17%), la réduction des fraudes et des abus (8%) et la rationalisation simplification des transactions financières (4%). Les dispositifs appareils les plus couramment utilisés par les programmes basés sur la technologie sont le téléphone et l'ordinateur pour 71% % et 39% % d'entre eux respectivement, et les applications les plus courantes en sont la voix (34%), le logiciel (32%) et les SMS (31%). Les donateurs sont les principaux bailleurs de fonds pour de 47% des programmes de santé basés sur les TIC.

Conclusion Différents types de TIC sont utilisés par les utilisées par des organisations privées pour relever les principaux des défis des clés dans les systèmes de santé. Une implémentation réussie de ces technologies exige cependant des sources de financement plus stables, un support plus important soutien accru pour l'adoption des nouvelles technologies et de meilleurs moyens pour en évaluer l'impact.

Резюме

Электронное здравоохранение в странах с низким и средним уровнем дохода: выводы Центра инноваций на

Цель Предоставить описание использования информационно-коммуникационных технологий (ИКТ) в программах, направленных на улучшение финансирования и повышение качества предоставления услуг здравоохранения в частном секторе в странах с низким и средним уровнем доходов, включая основные применения технологий и типов используемых технологий.

Методы Среди стран-партнеров было выбрано 16 стран, в которых систематических проводился поиск инновационных программ в сфере здравоохранения, после чего составленные профили добавлялись в базу данных Центра инноваций на рынке здравоохранения. Эти данные были дополнены сведениями, полученными с помощью обзоров литературы, и сведениями, предоставленными самими программами.

Результаты Во многих странах с низким и средним уровнем дохода ИКТ используются все чаще, с различными целями и в разных областях, относящихся к здравоохранению. Из программ, использующих ИКТ, 42% применяют их для расширения географического доступа к услугам здравоохранения, 38% – для повышения качества обработки данных и 31% – для облегчения общения между пациентами и врачами за пределами кабинета врача. К другим целям относятся усовершенствование диагностики и лечения (17%), борьба с мошенничеством и злоупотреблениями (8%), а также оптимизация финансовых операций (4%). Наиболее распространенными устройствами, применяемыми в программах, использующих информационно-коммуникационные технологии, являются телефоны и компьютеры, их используют 71% и 39% программ соответственно, а наиболее распространенными областями применения являются голосовая связь (34%), программное обеспечение (32%) и текстовые сообщения (31%). Спонсоры являются основными источниками финансирования 47% программ в сфере здравоохранения, использующих ИКТ.

Вывод Частными организациями используются различные типы ИКТ с целью решения ключевых задач в системе здравоохранения. Тем не менее, для успешного внедрения технологий необходимы более надежные источники финансирования, более высокий уровень поддержки при внедрении новых технологий и более эффективные способы оценки полученных результатов.

Resumen

Sanidad electrónica en países de ingresos bajos y medios: resultados del Centro para la Innovación en el Mercado Sanitario

Objetivo Describir cómo se utiliza la tecnología de la comunicación y de la información (TIC) en los programas que aspiran a mejorar la financiación y el suministro de asistencia en el sector sanitario privado de países con ingresos bajos y medios, incluyendo las principales aplicaciones de la tecnología y los tipos de tecnologías que se utilizan.

Métodos Colaboradores nacionales de 16 países realizaron una búsqueda directa y sistemática de programas sanitarios innovadores y recopilaron perfiles en la base de datos del Centro para la Innovación en el Mercado Sanitario. Estos datos se complementaron con revisiones bibliográficas y datos procedentes de informes propios suministrados por los programas.

Resultados En muchos países con ingresos bajos y medios está aumentado el uso de la TIC para diferentes fines en diversas áreas relacionadas con la salud. De los programas sanitarios con TIC, el 42% la utilizan para ampliar el acceso geográfico a la asistencia sanitaria, el 38% para mejorar la gestión de datos y el 31% para facilitar la comunicación entre pacientes y médicos fuera de la consulta. Otros fines incluyen: la mejora del diagnóstico y el tratamiento (17%), la disminución del fraude y del abuso (8%) y la racionalización de las transacciones financieras (4%). Los dispositivos más utilizados en los programas con asistencia tecnológica son los teléfonos y ordenadores, empleados por los programas en un 71% y un 39% respectivamente, y las aplicaciones más comunes son la voz (34%), el *software* (32%) y los mensajes de texto (31%). Los donantes son los principales financiadores del 47% de los programas sanitarios basados en TIC.

Conclusión Las organizaciones privadas están utilizando varios tipos de TIC para abordar desafíos clave del sistema sanitario. No obstante, para que puedan implementarse de forma satisfactoria, es necesario disponer de fuentes de financiación más sostenibles, de un mayor apoyo para la adopción de nuevas tecnologías y de mejores vías de evaluación del impacto.

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