

REVIEW ARTICLE

Application of Information and Communication Technology for Scaling up Youth Sexual and Reproductive Health

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Abstract

The pervasive presence of the internet and the commonality of mobile devices for communication technology have changed modalities for information exchange. Recent developments in information and communication technology (ICT) have specific implications regarding dissemination of information among youth, as exemplified by the Arab spring. The opportunity of those emerging technologies should be seized upon. ICT platforms should be used to scale-up policies and programmes that promote the sexual and reproductive health of youth due to their low cost, increased access to remote populations, better efficiency and improved flexibility for programming. Successful models should be identified through programme evaluation. (*Afr J Reprod Health 2012 (Special Edition); 16[2]: 197-205*).

Résumé

L'omniprésence de l'internet et la popularité des appareils mobiles pour la technologie de communication ont changé les modalités pour l'échange d'informations. Les développements récents dans la technologie de l'information (TIC) ont des implications spécifiques en matière de diffusion de l'information chez les jeunes, comme en témoigne le printemps arabe. Ces technologies émergentes devraient être utilisées bien plus souvent en vue des possibilités qu'elles offrent. Les plates-formes TIC devraient être utilisées pour intensifier le développement des et des programmes qui favorisent la santé sexuelle et de reproduction des jeunes en raison de leur faible coût, un accès accru aux populations les plus isolées, une meilleure efficacité et une flexibilité améliorée pour la programmation. Les modèles réussis devraient être identifiés à travers l'évaluation des programmes (*Afr J Reprod Health 2012 (Special Edition); 16[2]: 197-205*).

Keywords: Adolescent; Public-private partnerships; Health promotion; Community mobilization; Text messaging; Communications media

Introduction

Rationale

The value of media for health promotion activities among youth has long been recognised and in 1986, the World Health Organization recommended the application of interactive and audiovisual features of modern media besides peer collaborative interaction for conveying health information.¹ Subsequent opportunities from progress in information and communication

technology (ICT) led to the popularisation of the internet and mobile devices with applications of related tools in international development. With remote populations now having increased access to ICT at a low-cost, there are opportunities for promoting the reproductive health of youth especially with their adaptability, familiarity with and high usage of those emerging technologies.²

In the field of public health, the term electronic health (eHealth) has been coined to describe uses of ICT whereas mobile health (mHealth) refers to related applications of mobile

technology, the acronym m4RH being specific for reproductive health.³ ICT is being used for numerous applications for direct service provision regarding diagnosis and treatment besides data collection for health information systems, disease surveillance, monitoring and evaluation. It is therefore essential that public health professionals become aware of both opportunities and disadvantages of those technologies so to promote their appropriate leverage in their work.

From Silicon Valley to Rift Valley

Media, such as the radio, television, telephone, fax, internet and related mobile technology, have advanced substantially in the last two decades in respect to capability, access and integration across platforms. Telephones are no longer merely used for voice communication due to their potential when linked to the internet. As a very simple example, a smart phone can easily be used to check emails or live stream video, and a more basic mobile phone is capable of transferring funds between mobile phones, banks and businesses as exemplified in East Africa with banking through M-PESA, M standing for mobile whereas Pesa is the Swahili word for money. Whereas the emergence of the mobile phone in the late 1980s started the transformation of the world of communication, the pending introduction of the next generation of mobile phone technology will lead to numerous applications, some being not yet imaginable. The technology boom of the 1980s in the Silicon Valley in California has spread throughout the world and Africa is currently benefiting from practical applications as exemplified by recent developments in the Rift Valley in Eastern Africa where community-wide interventions have shown the potential for improving the wellbeing of youth.

Africa obtained wireless technology long after the global North but from the very beginning, it benefited, from the superior satellite infrastructure thereby bypassing the need for landlines with their complicated introduction and maintenance. The shores of subSaharan Africa have lately received a multitude of undersea fibre-optic cables from Europe, the Middle East and Asia for optimal internet connectivity to the global broadband

networks.³ The economies of countries in Africa are benefiting from the ICT environment with improved transfers of money, accessibility to the market and communication in rural settings. However, policies and guidelines for ICT are unfortunately still limited in most subSaharan countries and there is a lack of coordination between stakeholders. Whereas subSaharan Africa had substantial areas without telephones only a few decades ago, it now has more than 300 million wireless telephone subscribers and mobile networks are far reaching with Vodacom in Tanzania boasting that its coverage includes the top of Mount Kilimanjaro.⁴ Efforts to facilitate access to communication technology continue to show improvements as reflected in the indicators for 2010: for every 100 inhabitants of Africa, there were 1.5 fixed and 45.2 mobile telephone subscriptions besides 0.2 wired broadband subscriptions, the corresponding global figures being 17.2, 78.0 and 7.6 respectively.⁵

In parallel to mobile technology, the rapid advancement of the internet, in both depth and spread, has changed the dynamics of relationships and access to resources. However, access to internet remains a challenge in subSaharan Africa with the current global digital divide, although it is expected to be overcome in the near future through improved technology. Nevertheless, ICT continues to advance quickly, with people adopting new practices and innovating their work to exploit the available bandwidth. Information and communication technologies for development (ICT4D) have emphasised applications in disadvantaged areas for the purpose of social change but with its rapid spread, it has been difficult to assess and evaluate its impact.

Whereas the value of ICT4D for improving access to information is recognised, its effect on traditional cultures in certain societies, both financially and culturally, should be taken into consideration. ICT is updated continuously, and as new technologies emerge, they become part of the mainstream faster than ever before. Furthermore, they are improved by the consumers through open source technology and continuous research and development. Open source technology is a way to reduce costs and tailor a tool or platform to your needs. The variety and

depth of available ICT have expanded, making it even more important for individuals to learn the benefits and disadvantages of each tool available. While radio and television continue to demonstrate their capability and success as ICT in the field of development, the focus of this review will be on the newer mobile and internet technologies including social networking websites and mapping capabilities. However, understanding the value of each tool is essential as ICT reaches its optimal capability through interconnectedness.

Applications for public health

The use of ICT in addressing health concerns was discussed as far back as 1994 at the first World Telecommunication Development Conference and in 2008, the International Telecommunication Union published guidance for the use of ICT in the field of public health. With the emergence of new technology and the exploration of existing platforms for innovative applications, the field of ICT is currently revolutionizing the field of public health⁶ and with changing platforms, time spent immersed using the tools is invaluable for developing a better understanding of their ability to support health systems strengthening, advocacy, training, service delivery and programme evaluation.

Similarly, MHealth has promoted mobile phone use for youth issues, such as health promotion, disease prevention and health education, by drawing upon peer interaction and community participation for the dissemination of information. With the short life span of MHealth for reproductive health programming, its impact is still uncertain but efforts are being made for data collection for monitoring and evaluation. Through collaboration in this field, programmes have emerged in the public, private and non-profit sectors.

The development of public-private partnerships is desirable for the improvement of technology to support international development. In 2006, the UN Secretary General created the United Nations Global Alliance for ICT and Development to address the digital divide with an emphasis on developing more public-private partnerships. Phones for Health, which is

managed by the CDC Foundation, exemplifies the value of a public-private partnership where donors, manufacturers, mobile phone companies and public health organizations are collaborating to strengthen health systems.⁷

Reproductive health programs have drawn upon software, such as EpiSurveyor, to use PDAs, smart phones and other mobile technology, to optimize project management and data collection. The field of monitoring and evaluation of public health programs has benefited from easier to use data collection tools, especially the synchronization of mobile phones to web-based platforms has promoted more reliable and current data for analysis.

Like some other components of health care, youth health has specially benefited from the application of ICT for strengthening health systems in areas such as health records, appointments and other organizational information which can be collected, stored and easily transferred to the necessary party. However, ICT in the transfer of sensitive health information to clients requires particular attention, especially with mobile phones.

Besides, ICT has also become a centerpiece for the training of health workers, their professional development being now enhanced through internet-based distance learning that obviates the need for travel and time off from work and their capacity in the use of ICT increased through exposure.

For advocacy, public health organizations have traditionally used flyers, posters, websites and large-scale events. With the internet, advocacy work has found other lower cost options using blogs, message boards and other social platforms. Professional organizations are increasingly using their Facebook pages to provide up-to-date information on their events and activities in a way that is easily accessible to users. Similarly, Twitter provides a platform for organizations to offer live updates about their activities and status.

It is therefore important for public health professionals, as part of their professional development, to become familiar in using social networking platforms such as Facebook and Twitter. Additionally, their use is a low-cost way of enhancing social and professional networks

along with connecting with pertinent topics for their field of work. This approach will also reach more youth as they are heavy users of those media.

As opposed to data collection, the use of ICT in service delivery requires further research and piloting. Given the number of tools on the market, it is essential to understand the subtleties of local use for mobile phones and internet prior to applying them for service delivery. Challenges include the limited coverage of mobile phones, differential access to technology by age group, ICT literacy and variability regarding preferences for phone company as service provider. Programmes that properly harness technology, especially for service delivery, will be much ahead and benefit greatly for achieving their goals.

Targeting youth

Historically, media work has been identified as an invaluable resource for the education of youth. As the Secretary of Public Education in Mexico in 1922, Jose Vasconcelos innovated by supporting artists such as Diego Rivera to use art in the form of murals as mass media for the education of youth. Over the ensuing decades, media have been used in different ways for health promotion among youth as exemplified by WHO regarding the use of music and drama and more recently with applications of community mapping, with personal mobile devices and geographical positioning systems, in strategies for youth education to increase their participation. As media technology advances, reproductive health programming is given the opportunity to innovate. ICT offers new resources for mass media work with a competitive advantage in boosting interactivity, connectivity and cost-effectiveness.

As Special Rapporteur of the United Nations on the promotion and protection of the right to freedom of opinion and expression, Frank La Rue has deplored the inappropriate blocking of certain websites, or their contents, and recommended enhanced internet access by disadvantaged groups to enable them to assert their rights.⁸ Furthermore, he has specifically advocated for the active participation of youth in the context of the Arab spring.⁹ The Millennium Development Goal (MDG) 8 addresses partnerships for international

development and ICT is prominent: its sixth target (8F) focusses on the availability of benefits from new technologies in cooperation with the private sector specially for information and communications, related indicators including the percentage of the population who are either mobile phone subscribers or internet users. Youth health is directly linked to MDG 5 for sexual and reproductive health and MDG 6 for HIV. With the MDGs being interconnected, ICT activities for MDG8 can help to achieve youth health for MDGs 5 and 6.

Internet

The internet provides vast information, especially useful in dispersing relevant information to a specific group. However, its potential is limited if its web pages are read passively. By focusing on the internet as a manageable, yet constantly changing tool, the opportunities are endless.

This mindset is relevant in connecting age groups and stimulating discussion around topics using the internet. The global use of social media tools has transformed the lines of communication between peers, various forms of media providing outlets for the expression of thoughts and a comfortable environment for questions. A news article on the internet is no longer complete without tags, shares and links to Facebook or Twitter. YouTube, a platform to view videos, has become an essential means of communications among youth and its value became evident during movements such the Arab spring recently. YouTube has become a form of expression and way of networking: it allows viewers to interact with each other and the video by adding comments. Advertisements, short movie clips or videos made for YouTube make their way onto the airwaves of the platform for the purposes of art, entertainment, advocacy and in some cases, fundraising. In 2011, students from Wesleyan College in the United States produced a short video, "I have Sex", to counter ideological attacks against programmes¹⁰ of the Planned Parenthood Federation of America: its wide popularity in social media, such as Facebook and Youtube, sent a strong message to the United States Congress

which maintained funding from the federal government for that organization.¹¹

The transformation of Facebook, from a purely social networking tool to a platform for news dissemination has increased its value with a multitude of peer-reviewed medical journals, professional associations and international agencies now being on Facebook and Twitter. Additionally, those social networking platforms have become compatible with use on mobile phones thereby increasing their accessibility to non-internet users.

Mass media campaigns, that incorporate internet technology in the delivery of their message, are becoming more popular and have demonstrated success. The ease and convenience of access, at low cost, to youth of reproductive age through tools such as Facebook, would have been unimaginable 20 years ago but its potential must now be optimized as a strategy. Social networking sites with a user group, largely composed of youth, have created an environment for sharing information and opinions. As with all project design, it is ill-advised to incorporate technology in a mass media campaign without careful planning. The importance of targeted messaging cannot be understated in media campaigns due to the facility of information flow on the internet. Access by an individual to an inappropriate message regarding characteristics such as age, religion or country of origin, could have negative external effects specially in the sensitive context of reproductive health. Additionally, with the saturation of air waves, it becomes important for organizations to invest time into understanding the end consumer.

As youth are skilled consumers of technology, a successful campaign will require extensive research. Facility of sharing information and linkages with other tools are prerequisites for the success of networking platforms. Youth reproductive health programs have demonstrated that the crucial role of youth involvement in programming and their participation in the application of emerging technologies will improve outreach and impact. Fortunately, the participatory approach is already built into many of the current platforms through the advent of comments, blogs and the 'share button'. While

users in subSaharan Africa have begun interacting on YouTube and Facebook, low bandwidth and limited access to internet have restricted its spread but this type of mass media campaign can be reproduced on mobile phones using other platforms such as short message service (SMS) and multimedia messaging services (MMS) and that are more common in the African region.

Mobile technology

While a basic mobile phone is enabled for voice calling and messaging; youth favour the latter given its lower cost among other factors. SMS provides a quick and efficient way to remain in contact with others and are constantly being adopted for new purposes such as music downloads, fundraising campaigns and Face-book updates. They are now being harnessed for applications in the delivery of reproductive health services.

Mobile phone SMS campaigns are being used for the dissemination of information for facilitating health promotion after their success for improving healthy behaviour regarding smoking, diet and exercise.² And now its potential is being used for youth reproductive health for accessing information on family planning and sexually transmitted infections.^{12,13} Its value for disseminating a wide range of readily available information on sexual and reproductive health issues, specially to youth and community health workers, has been demonstrated in various projects across Africa.¹⁴

The value of mobile phones for large-scale public health programming has been demonstrated by "Text to Change" campaigns for HIV awareness in Uganda.¹⁵ Working in South America and Africa, it exploits the use of Interactive Voice Responses Services to extend access to an illiterate population. SMS is an opportunity to integrate reproductive health messaging into the daily use of mobile technology by youth. But the limit of 160 characters for text messaging is a major limitation. For a volunteer medical male circumcision campaign in Iringa, Tanzania in 2011, Jhpiego, an affiliate of Johns Hopkins University, used 'Text to Change' to launch an SMS information service for their

campaign. Interested individuals could text “TOHARA” (Circumcision in Kiswahili) to get more information about male circumcision and HIV and “WAPI” (Where) to find out where male circumcision services would be provided. Data generated from users of these services was easy to collect, as the platform traced the number of unique users that accessed each information service. The data collected, especially from “Wapi” provided insight on how to improve the design of the campaign.¹⁶ Use of SMS technology was shown to be cost-effective and facilitated the scale-up of activities.

This type of innovation in mobile phone use shows that phones are no longer being merely used for voice, but are linked to computers and other technologies in this digital era. Given the increased use of mobile phones throughout the world, many platforms have developed to leverage this increased outreach, based on a change in information flow, for solving problems in the field of development. Meaning “testimony” in Swahili, Ushahidi exemplifies this type of platform by using various components of technology including mobile technology, internet and geographical positioning systems to generate innovative solutions to existing problems.¹⁷ Ushahidi emerged as a useful technology after the 2008 elections in Kenya by demonstrating its value to report the violence that was occurring throughout the country. Through the use of data that are collected by various sources including SMS, email and the web, Ushahidi enables the visualization of the data on a map or timeline. For example, Ushahidi was used in Haiti for earthquake and post-earthquake relief work such as finding survivors, identifying infrastructure damage and advertising services. Users either sent an SMS or a message via Twitter to report first-eye accounts of security threats, public health concerns or other emergencies. These messages became data points on a map that was used by health workers to identify sites that required assistance. With its data being generated through user participation, Ushahidi is an open-source platform with access to a wide range of information sources and the assessment of its reliability remains a challenge. Crowd-sourced information has nevertheless been applied to different settings, a recent example being from

UNAIDS for its youth strategy earlier this year:¹⁸ Ushahidi was used to reach youth for their substantial participation through contributions to strategy development that also included regional electronic discussions with peers in various languages. Ushahidi therefore exemplifies south-south cooperation using an innovative approach that started in the South.

In the context of reproductive health, campaigns for youth should draw upon tools that are already being used by youth such as the internet and mobile phones. Youth are using these types of technologies to tap into new knowledge. Media technology for reproductive health removes an obstacle to accessing information privately by providing access to information with an anonymity that often does not exist in a clinic waiting room. For example, using message boards on the internet, women can discuss and receive advice on personal topics such as negotiating condom use without fear of being recognized in their community.¹⁹

Youth play a prominent role in introducing other members of their community to ICT given their adaptability; therefore, their access and use of technology is pivotal in its spread. Globalisation has led to the prompt dissemination of information besides more sharing of perspectives, opinions and values. In the Arab Spring, youth demonstrated the value of the internet for freedom, tolerance and human rights. They also showed the determination of youth to direct the governance of their respective countries. However, the Arab Spring did not only flower with the power of technology; there were many other important factors that led to each revolution. For other countries, whether it is for a political revolution, reproductive health programming or the reading of the newspaper, the interactions of youth with technology will differ and not have the same outcome.

Challenges

While ICT is changing interactions around the world by drawing upon the availability and accessibility of information from the internet, numerous challenges have limited its applications despite the opportunities for crossing geographic, political and social boundaries.²⁰ Unfortunately,

its ability to transcend geopolitical borders increasingly confronts resistance from certain governments that seek to limit the availability of information on the internet: this censorship is diametrically opposed to the approach of the creators of the web who aimed for access to a universal source of information. Reporters without Borders has recently documented extensively the role of “hacktivists” to support “netizens” to counter responses from repressive regimes that suppress the dissemination of unwanted information, sometimes supposedly for security reasons, whether through judicial, technical or physical barriers.²¹ Finally, it is most regrettable when government-funded public bodies block access to international websites, specially audiovisual media and authoritative sources, that offer opportunities for the capacity development of youth through the availability of information of universal value. In the specific case of television programmes, it is specially unfortunate when there is a mercantile rationale for increasing paid subscriptions from individuals to enable access to earlier programmes at the website of the television station. Specifically, national broadcasting authorities should do their utmost to ensure that commercial interests, such as individual subscriptions to television networks, do not block electronic access to websites of audiovisual media that are freely accessible in other jurisdictions: this approach would substantially help youth who are eager to be well informed.

In the context of using media technology for scaling up reproductive health for youth, policies are needed to overcome these challenges affecting both the internet and mobile technology. Many government policies on ICT restrict openness and competition thereby limiting opportunities for further development and applications. Intersectoral partnerships should be strengthened in the public sector, as exemplified by collaboration between ministries of technology and health, for progress towards an environment conducive to the advancement of those fields with incorporation of ICT into national strategies.

Poor access to the internet in certain countries continues to be an obstacle to ICT growth, as pointed out by the World Health Organization in the survey by its Global Observatory for eHealth.²²

Furthermore, the high cost of internet use in some areas remains prohibitive in the context of general use especially for youth. While mobile phones are more accessible, their service coverage can be spotty and their use is not yet ubiquitous. While the lower utilisation of mobile and internet technology in subSaharan Africa can easily be attributed to access to technology and high cost, cultural barriers also exist. ICT represents a revolution of ideas and ways of life and not merely a change in communication patterns.²³ The sexual and reproductive health of youth should be promoted by incorporating ICT in the capacity building of health workers though improving their knowledge of and familiarity with pertinent techniques for the practical applications of those methodologies.

With advances in the field of technology and the increasing number of users, opportunities for the application of media to programming for the sexual and reproductive health of youth occur continually. In this evolving field, service provision should be improved through collaboration between the private sector, such as phone service providers, and the public sector, specially ministries of health, youth and telecommunications besides nongovernmental organisations such as youth groups, reproductive health organisations and professional associations.

The strengthening of liaison between relevant stakeholders, literally “linking-in”, will facilitate communications and the development of a strategy at the field level. The utilisation, by public health services, of existing infrastructure in mobile technology will ensure cost-effectiveness but measures to maximize outreach to youth, as the target audience, should include the specific training of public health personnel to ensure that they are up-to-date with emerging technology as part of their professional development. As programme designers adopt technologies, they must be aware of the limitations of their offerings to make informed and appropriate decisions. Whereas the availability of emerging technologies offers a variety of choices, usefulness only results from the capacity to leverage their potential. Knowledge of the characteristics of and practices by users of mobile technology, specially their interactions with this dynamic industry, is essential

for collaboration with the media. Therefore, extensive research should be conducted on the targeting of messages for the sexual and reproductive health of youth.

Throughout the integration of media technology into reproductive health programming, data collection and analysis will provide valuable information on how to shape strategies in this relatively new field. As more organizations begin to use media technology in their work, monitoring and evaluation ought to lead to the development of certain practices that would be considered as having special value for other jurisdictions. Prompt evaluations should be carried out to identify those innovative projects that have potential to contribute towards the scaling-up of reproductive health services for youth.

Programming must push boundaries, use new resources such as media technology and work in a networked environment. ICT has provided a cost-effective and innovative way to improve programming. However, it is important not to get carried away with the tool itself: it should be remembered that the aim is for the actual application of the technology. It is therefore advisable to integrate media technologies into programming for the scaling-up of reproductive health of youth, especially in view of their adaptability to technological developments. In-depth research of youth, as the target audience, along with strengthened partnerships with stakeholders besides the development of guidelines and evaluation of service delivery should optimise the tools for improving applications for improving the sexual and reproductive health of youth.

Acknowledgements

Elizabeth Edouard held a David L. Boren Fellowship for 2011/12 when this assignment was carried out from Tanzania.

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