# Informal m-health: How are young people using mobile phones to bridge healthcare gaps in Sub-Saharan Africa?

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## ABSTRACT

The African communications 'revolution' has generated optimism that mobile phones might help overcome infrastructural barriers to healthcare provision in resource-poor contexts. However, while formal m-health programmes remain limited in coverage and scope, young people are using mobile phones creatively and strategically in an attempt to secure effective healthcare. Drawing on qualitative and quantitative data collected in 2012—2014 from over 4500 young people (aged 8—25 y) in Ghana, Malawi and South Africa, this paper documents these practices and the new therapeutic opportunities they create, alongside the constraints, contingencies and risks. We argue that young people are endeavouring to lay claim to a digitally-mediated form of therapeutic citizenship, but that a lack of appropriate resources, social networks and skills ('digital capital'), combined with ongoing shortcomings in healthcare delivery, can compromise their ability to do this effectively. The paper concludes by offering tentative suggestions for remedying this situation.

## 1. Introduction

The African communications 'revolution' has been remarkable: by the end of 2013, mobile phone penetration rates were estimated to have reached 80%, and a recent World Bank report (2014) noted that more Africans now have a mobile phone than have a toilet. Although only 11% of phones in Sub-Saharan Africa currently have fast internet access (3G), this proportion is rising rapidly as costs fall and demand increases. There is widespread optimism that mobile phones can help overcome infrastructural constraints and provide routes out of poverty, particularly in rural areas (see reviews by Donner, 2008; Porter, 2012). The potential for mobile phones to bridge healthcare gaps in low-resource settings has been grasped enthusiastically by the global health community, with significant investment in mobile health (m-health) initiatives (see reviews by Bloomfield et al., 2014; Aranda-Jan et al., 2014).

Much less well-documented are the many *informal* ways in which young people in particular are using mobile phones for health-related purposes. M-health initiatives remain limited in scope and coverage (Chib et al., 2014); among our study participants (over 4500 young people in Ghana, Malawi and South Africa), only a handful had ever *heard* of m-health programmes, let alone participated in them. Instead, they were using phones creatively and strategically to seek healthcare. In this paper, we elaborate on these practices and consider the possible consequences for overcoming structural healthcare barriers.

A note on definitions: UN organisations define 'adolescence' as

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the second decade of life (10—19 y) and 'youth' as ages 15—24 y. Here, we use the terms 'young people' and 'adolescents and young people' interchangeably to refer to our study participants aged 8—25 y, while recognising that growing up is a diverse and contingent experience that rarely maps straightforwardly onto chronological age.

### 1.1. Young people's access to healthcare in Sub-Saharan Africa

More than a quarter of the world's population — around 2 billion people — are aged between 10 and 24 years, with almost 90% of these living in low- and middle-income countries (ICPD, 2014). Adolescence and young adulthood are often considered to be among the healthiest periods of life, after the relatively vulnerable years of early childhood and before the health problems associated with ageing. However, young people across the world also face significant health challenges and barriers to care (WHO, 2012; Sawyer et al., 2012). The problems are typically magnified in low-income settings: Sub-Saharan Africa, which has the highest proportion of adolescents and young people worldwide, also has the worst adolescent/youth health profile (Patton et al., 2012; UNICEF, 2012).

Of course, barriers to healthcare in Sub-Saharan Africa are not confined to young people. Ghana, Malawi and South Africa (along with many other low- and middle-income countries) have all embarked on health systems reforms aimed at achieving universal coverage, but this is still far from being realised (Nyonator et al., 2014; Ataguba et al., 2014; Abiiro et al., 2014). In all three countries, a minority of the population has health insurance, despite the roll-out of the ostensibly pro-poor National Health Insurance Scheme in Ghana (Mills et al., 2012). The uninsured — disproportionately rural populations and those in the lower wealth quintiles — are reliant on public provision that continues to be patchy and under-resourced and/or incurring considerable out-of-pocket expenditure at private facilities (Nyonator et al., 2014; Ataguba et al., 2014; Abiiro et al., 2014; Mills et al., 2012). Of the three countries, only South Africa meets the WHO's recommendations for a minimum of 23 core health-workers (physicians, nurses and midwives) per 10,000 population, although with considerable geographical disparities (Ataguba et al., 2014). Ghana has 11 core health-workers per 10,000 population, and Malawi just three (WHO, 2014, n.d.).

Against this backdrop of limited and inequitable access, young people — who typically have limited economic resources, restricted mobility and low social status — can be particularly disadvantaged. Too old for paediatric services, but often marginalised or excluded from mainstream services, they can easily slip through the net. More than a decade since the WHO (2002) set out an agenda for establishing 'Adolescent-Friendly Health Services', the gap between provision and young people's needs in Africa remains substantial (WHO, 2012; Mburu et al., 2013; Chandra-Mouli et al., 2013). Where access to formal-sector services is limited, young people may resort disproportionately to a vast and highly eclectic 'informal sector' of unregulated healers and medicines (Van der Geest and Geissler, 2003; Hampshire et al., 2011). However, as therapeutic possibilities multiply, so do the potential risks, particularly where states lack the capacity to control and regulate pharmaceutical markets, allowing medicines and other therapeutic technologies to circulate freely (Baxerres and Le Hesran, 2011). The rise of sub-standard and counterfeit drugs adds to the uncertainty and potential risks (Caudron et al., 2008), as does media coverage of fraudulent healers (Shipley, 2009).

### 1.2. 'Informal' m-health and the society-technology dialectic

The potential for formal m-health initiatives to improve healthcare in low-resource settings has been widely hailed but, so far, that potential has not translated into large-scale policy investment (Chib et al, 2014:4). However, a key insight to emerge from scholarship on the new digital/media technologies is that change is often driven largely by *practice* rather than top-down planning (e.g. Horst and Miller, 2006; Jeffrey and Doron, 2013). Mobile phones and other technologies become appropriated, co-opted and used in ways that were not necessarily intended — or desired — by manufacturers or regulators. Moreover, these acts of appropriation are deeply embedded within existing social and cultural forms and wider 'ecologies of communication' (Horst and Miller, 2006:12). To pick just a couple of examples, the phenomenon of phone-based *Keitai* novels in Japan (Nishimura, 2011), or the proliferation of new language forms that SMS texting has generated, exemplify the inter-weaving of the local and the global in new cultural forms.

We should therefore perhaps not be surprised to find that, in the absence of large-scale formal m-health programmes, young people are taking the initiative to 'do m-health' *informally*. But how are they doing this and with what consequences? Seeking to move beyond rather sterile debates that set in binary opposition technological versus social determinism, Horst and Miller (2006) have argued persuasively that society and technology are dialectically related: that each becomes altered in interaction with the other. These insights are important for understanding how the uptake of new information and communication technologies might work to entrench and/or to disrupt health inequalities within and between countries.

## 2. Study sites and methods

The data presented here come from an ESRC/DFID-funded study (2012—15) on the impacts of mobile phones on young people's lives in Ghana, Malawi and South Africa (www.dur.ac.uk/child.phones/). It builds on and extends our earlier study (2006—10) on children's mobility in the same field-sites (www.dur.ac.uk/child.mobility/), when mobile phones were just beginning to feature in young people's lives (Porter et al., 2012). Ethical approval was granted from [UK: Durham University Anthropology Ethical Review Board. Malawi: National Committee on Research in the Social Sciences and Humanities (NCRSH) at the National Commission for Science and Technology (NCST)].

Fieldwork was conducted in 24 study sites across the three countries: one high-density urban, one peri-urban, one rural with basic services, and one remote rural settlement with limited or no services, in each of two agro-ecological zones per country (Ghana: coastal savannah and central forest belt; Malawi: Lilongwe plains and Blantyre/Shire Highlands; South Africa: Eastern Cape and Gauteng/North-West provinces). All eight urban sites were situated within 2—3 km of a large public hospital, with numerous public and private clinics nearer by (although of course physical proximity does not equate to effective access). The peri-urban sites had more basic clinics, staffed often by nurses or clinical officers, with reasonably good transport connections to towns with secondary facilities. In the rural sites, healthcare provision was generally sparser, particularly in Ghana and Malawi, where people relied largely on informal-sector healers/medicine-sellers or travelling to a more distant formal-sector facility. These disparities are evident in adolescents' use of health services in our 2006—2009 study, a good indicator of differential access (Ataguba et al., 2014): Table 1.

Fieldwork for the current study proceeded in two phases.

**Table 1**
Reported utilisation of formal-sector health services in preceding 12 months: survey respondents aged 9—18 y, by country and settlement type.

|  | Ghana | Malawi | South Africa |
|---|---|---|---|
| Urban | 42.8% | 53.2% | 52.6% |
| Peri-urban | 30.8% | 60.6% | 57.9% |
| Rural/services | 15.4% | 36.2% | 55.3% |
| Remote rural | 13.5% | 35.7% | 56.1% |
| ALL | 26.5% | 46.3% | 55.3% |

Rural—urban differences are statistically significant in Ghana and Malawi (Chi$^2$ p < 0.0005) but not South Africa.
Source: 2007/08 survey data.

Phase one (October 2012—August 2013) entailed in-depth interviews with young people (aged 8—25 y) in each study settlement about their phone use. A story-based approach was used to elicit accounts of important/notable phone use (or non-use) in relation to several themes: education, livelihoods, healthcare, political and religious life, etc., in order to document the full *range* of phone uses and associated impacts. Young people were invited to narrate in detail an incident where using (or not using) a mobile had been significant; for example, getting help in an emergency. A second interview technique involved asking participants to describe their phone use over the last day or two. Drawing on phone 'call registers', interviewees recounted details of often mundane, day-to-day calls, texts and social networking that provided an important counter-balance to the more 'exceptional' accounts. Altogether, approximately 500 interviews with young people were conducted in each country, alongside a smaller number of focus groups and interviews with parents/carers and key informants (principally community leaders, teachers and health-workers). In the second fieldwork phase (October 2013—March 2014), a questionnaire survey was administered to 4626 young people aged 8—25 years across the 24 sites (approximately respondents 190—200 per site). The aim of the survey was to test emergent hypotheses from the interview data and establish patterns of phone usage and impacts by gender, age, rural—urban residence, etc.

The 'informal' nature of study settlements precluded using standard household registration-type sampling techniques. Instead, enumerators walked randomly-selected transects through settlements, calling on each household on the route. The household head (or another responsible adult) was asked to list all household members (present and absent) and their ages. In households with more than one eligible respondent (aged 8—25 y), one name was drawn by ballot. As far as possible, the fieldwork was conducted at times when young people were likely to at home: evenings, weekends and school holidays. When the selected respondent was absent, the enumerator would return later if possible to complete the questionnaire or interview. In each country, trained research assistants conducted the interviews and administered questionnaires orally in local languages. Lead country collaborators supervised all data collection on-site, overseeing sampling and checking questionnaires, and kept a running tally of completed questionnaires by age and gender. Towards the end of the survey in each settlement, if a particular gender/age group was clearly under-represented, enumerators were asked to over-sample that group in the remainder of households.

The survey data were analysed using SPSS v.20. Data were entered in-country with UK coordinators conducting random 'spot checks'. For the in-depth interviews, research assistants made hand-written notes during the interview, with as much *verbatim* detail as possible; these were typed up shortly after each interview, translated into English (leaving key/untranslatable terms in the original language) and manually coded for themes. Analysis was

thematic and primarily inductive, based on the principles of grounded theory, whereby theoretical insights emerge from the data rather than vice versa (Strauss and Corbin, 1998).

## 3. Results

### 3.1. Socio-demographic characteristics and patterns of phone ownership and use

Key socio-demographic characteristics of the survey sample in each country are shown in Table 2. Mobile phones were widely used by young people in all three countries: Table 3. The vast majority of survey respondents (84.4%) had at least one mobile phone in their household; by contrast, only 1.3% had landlines. About two-fifths currently owned a mobile phone, but over half had done so at some point in their lives. Phones are widely shared, so *usage* substantially exceeded *ownership*: nearly 60% had used a mobile phone within the week preceding the survey, almost three-quarters had done so within the preceding four weeks, and over 80% within the past year. The speed of uptake has been remarkable: since our 2007/8 survey (in the same settlements), the number of households surveyed with at least one mobile phone has doubled (from 42.9% in 2007/8 to 84.1% in 2013/14) and the proportion of adolescents (aged 9—18 y) who had *never* used a mobile phone has dropped from 25.1% to 8.5%.

Phone ownership and usage were highest in South Africa, followed by Ghana and then Malawi, reflecting earlier uptake and phone/network availability (Porter et al., 2012). South Africans

**Table 2**
Survey sample socio-demographic characteristics.

|  | Ghana (N = 1568) | Malawi (N = 1544) | South Africa (N = 1514) | All (N = 4626) |
|---|---|---|---|---|
| **Gender** |  |  |  |  |
| Female | 44.8% | 49.9% | 50.1% | 48.2% |
| Male | 55.2% | 50.1% | 49.9% | 51.8% |
| **Age group** |  |  |  |  |
| 8—13 y | 35.7% | 37.2% | 35.5% | 36.1% |
| 14—18 y | 30.2% | 29.3% | 32.2% | 30.5% |
| 19—25 y | 34.1% | 33.4% | 32.4% | 33.3% |
| **Settlement type** |  |  |  |  |
| Urban | 25.1% | 24.7% | 26.0% | 25.3% |
| Peri-urban | 25.7% | 24.9% | 26.9% | 25.9% |
| Rural/services | 25.4% | 25.2% | 24.2% | 24.9% |
| Remote rural | 23.9% | 25.1% | 22.8% | 23.9% |

2013/14 survey data

**Table 3**
Phone ownership and use.

| Phone ownership/use (percentages) | Ghana (N = 1568) | Malawi (N = 1544) | South Africa (N = 1514) | All (N = 4626) |
|---|---|---|---|---|
| Mobile phone in household | 93.1% | 60.8% | 99.5% | 84.4% |
| Currently owning mobile phone | 34.7% | 18.6% | 63.2% | 38.6% |
| Ever owned a mobile phone | 48.8% | 34.8% | 78.6% | 53.9% |
| **Most recent mobile phone use:** |  |  |  |  |
| Last 7 days | 54.9% | 41.6% | 83.0% | 59.6% |
| 1—4 weeks ago | 17.2% | 16.1% | 5.5% | 13.0% |
| 1—12 months ago | 9.0% | 14.9% | 3.7% | 9.2% |
| Over 12 months ago | 3.3% | 3.1% | 1.7% | 2.7% |
| Never | 15.6% | 24.3% | 6.0% | 15.4% |
| Landline phone in household | 1.1% | 0.6% | 2.2% | 1.3% |
| Ever used landline phone | 7.8% | 8.5% | 35.6% | 17.1% |

**Table 4**
Variation in mobile phone ownership and use.

| | Ghana (N = 1568) | Malawi (N = 1544) | South Africa (N = 1514) | All (N = 4626) |
|---|---|---|---|---|
| **(a) Current mobile phone ownership** | | | | |
| Gender | | | | |
| Female | 29.2% | 14.8% | 64.5% | 36.2% |
| Male | 39.2% | 22.4% | 61.9% | 40.9% |
| Age group | | | | |
| 8–13 y | 3.4% | 0.5% | 34.1% | 12.3% |
| 14–18 y | 31.3% | 18.3% | 69.3% | 40.2% |
| 19–25 y | 70.6% | 39.0% | 89.0% | 65.8% |
| Settlement type | | | | |
| Urban | 51.4% | 36.1% | 68.5% | 52.2% |
| Peri-urban | 39.7% | 24.2% | 62.5% | 42.5% |
| Rural/services | 26.7% | 6.9% | 65.4% | 32.4% |
| Remote rural | 20.3% | 7.5% | 55.5% | 26.8% |
| All | 34.7% | 18.6% | 63.2% | 38.6% |
| **(b) Mobile phone use in the preceding 4 weeks** | | | | |
| Gender | | | | |
| Female | 67.3% | 54.0% | 89.6% | 70.3% |
| Male | 75.0% | 61.4% | 87.6% | 74.9% |
| Age group | | | | |
| 8–13 y | 50.3% | 40.0% | 78.4% | 55.8% |
| 14–18 y | 76.7% | 67.1% | 91.6% | 78.8% |
| 19–25 y | 91.0% | 69.2% | 96.6% | 85.6% |
| Settlement type | | | | |
| Urban | 84.5% | 84.6% | 92.4% | 87.3% |
| Peri-urban | 80.4% | 73.0% | 90.4% | 81.4% |
| Rural/services | 63.7% | 41.1% | 88.3% | 63.9% |
| Remote rural | 58.8% | 32.7% | 82.0% | 56.9% |
| All | 72.1% | 57.7% | 88.5% | 72.6% |

N.B. All differences statistically significant (p Chi$^2$<0.005) except gender and phone ownership in South Africa.

were also much more likely to have internet-enabled (3G) phones: nearly a third (32.8%) of South African survey respondents had used phone-based internet in the preceding four weeks, compared with 8.7% in Ghana and 5.4% in Malawi. Within each country, older respondents and those living in urban/peri-urban areas were more likely to own and use a mobile phone than rural-dwelling and younger respondents: Table 4. In Ghana and Malawi, males were

more likely to own and use mobile phones than females, while the opposite was true in South Africa: a pattern that has persisted over time (Porter et al., 2012).

### 3.2. Young people's health-related phone practices

We now turn to our central question: whether and how young people are using phones to seek healthcare.

#### 3.2.1. Calling for help (practical and material)

First, mobile phones can enable communication with people who might be able to help in the event of sickness or other health crisis. Altogether, just over a third (35.0%) of survey respondents reported having used a mobile phone in the preceding 12 months because they were unwell, while 31.1% had done so in connection with *someone else's* illness. South Africans were significantly more likely to have used a mobile phone in this way than those in Ghana or Malawi: Table 5.

In all three countries, young people most often reported calling a household member or someone else living locally; sometimes simply to convey information but often to request help, ranging from hands-on care or assistance getting treatment, to reporting absence from school/work and arranging childcare. As these three examples illustrate, even quite young respondents were able to solicit help in this way:

> 'My mother fell sick and there was no one else at home. So I took her phone and flashed* my big sister who is at school. After I flashed her, she called me. I explained the situation and she called my aunt [...] and she came and took my mother to hospital.'
>
> (Malawi, 13 y girl)

[*'Flashing' (or 'buzzing') is the practice of leaving intentionally missed calls so that the recipient will call back.]

> 'Two months ago my grandfather collapsed at home. I took his phone quickly and phoned another old man who lives nearby to come and take him to the clinic. I have his phone number because he usually takes my grannies to collect their pension money. He did not take long to arrive at our house; he rushed grandfather to the nearby clinic.'
>
> (South Africa, 11 y girl)

**Table 5**
Mobile phone use in the preceding 12 months because of illness.

| | Ghana (N = 1568) | Malawi (N = 1544) | S. Africa (N = 1514) | All (N = 4626) |
|---|---|---|---|---|
| No. (%) using mobile phone for _own_ illness | 511 (32.6%) | 423 (27.4%) | 686 (45.3%) | 1620 (35.0%) |
| No. (%) using mobile phone for _another's_ illness | 427 (27.2%) | 422 (27.3%) | 589 (38.9%) | 1438 (31.1%) |
| **For own illness** | | | | |
| *WHO was called? (%)* | | | | |
| Household member | 14.5% | 9.1% | 30.1 | 17.8 |
| Local friend/relative/neighbour | 10.5% | 13.3% | 16.5 | 13.4 |
| Non-local friend/relative/neighbour | 8.7% | 7.2% | 6.0 | 7.3 |
| Overseas friend/relative/neighbour | 0.4% | 0.8% | 0.4 | 0.5 |
| Boss/employer/colleague/teacher | 3.1% | 1.7% | 3.7 | 2.8 |
| Doctor/nurse/healer | 1.8% | 1.7% | 1.9 | 1.8 |
| Ambulance/other transport | 0.1% | 0.1% | 0.7 | 0.3 |
| Other | 0.4% | 0.5% | 0.6 | 0.5 |
| *Reason for calling (%)* | | | | |
| To provide care | 7.5% | 5.5% | 13.1 | 8.7 |
| For advice | 1.0% | 1.2% | 7.2 | 3.1 |
| Take arrange healthcare visit/transport | 7.3% | 4.1% | 13.4 | 8.2 |
| To bring/buy medicines | 2.0% | 1.9% | 6.7 | 3.5 |
| Request money (for treatment/transport) | 6.4% | 3.7% | 7.8 | 5.9 |
| Report absence from school/work | 3.6% | 2.4% | 4.2 | 3.4 |
| Arrange childcare | 0.1% | 0.1% | 0.9 | 0.3 |
| Information only | 16.1% | 18.2 | 22.7 | 19.0 |

'One time one of my siblings was ill. I had to use my phone to inform my father because my mother did not have money to take him to hospital. There was someone selling medicines that came round but we did not know that man and whether his medicines are good. My father told my mother to borrow money from a particular man to go to hospital.'

(Ghana, 13 y boy)

Other situations may necessitate calling on a (geographically/ socially) wider circle. For example, if expensive treatment is required, having financially better-off contacts might be important; perhaps relatives living in a city or overseas. Although only a small proportion of survey respondents had called someone abroad to request such help, having and maintaining these networks can prove crucial in coping with more complicated and/or protracted health problems, as this young man's account illustrates:

'Sometimes when my mother is not well, I will call my sister [in UK]. [...] You know the cost of calling people abroad is very high. I buy small credit and call her but the credit runs very fast, so we do not talk for long. I spend a lot of money on credit because of those international calls [but] when I am hard pressed, I just buy some credit and call my sister and ask for some money. At worst, in less than one month I am able to get some money from her.'

(Ghana, 20 y man)

Other 'useful' contacts include health professionals and/or transport operators. Only a relatively small proportion of survey respondents had called one or other of these to get help because of sickness, but interviewees' accounts underlined the potential importance of these contacts, as we elaborate below. In addition, of the 686 survey respondents who reported having a biological child of their own, 45 (6.6%) had used a mobile phone to call a nurse or midwife in connection with their own or their partner's pregnancy/

childbirth, and 64 (9.3%) had used a phone to arrange transport to a health facility for ante-natal care or childbirth. Again, these practices were more common in South Africa than the other two countries: Table 6.

### 3.2.2. Advice and information

Besides immediate practical/material help, nearly a fifth (18%) of young people surveyed had used mobile phones in the preceding 12 months to obtain health-related *advice* or *information* about specific symptoms, medicines, healers and − particularly in South Africa − information on sexual/reproductive health: Table 7. Some sought this information from personal contacts or health professionals, but many more used mobile phones to consult the Internet or other sources.

A key feature of the 'mobile phone revolution' in the Global South has been to enable Internet access in the absence of computers (Horst and Miller, 2006). Among our study participants, Internet access had come almost entirely through mobile phones, particularly in South Africa, where 3G phones are more widely available than in Ghana or Malawi (see above) and where 'data bundles' are cheaper than 'talk time'. In South Africa, around a sixth of respondents (16.1%) had used a mobile phone to search for health-related information on the Internet (compared with fewer than 2% in Ghana or Malawi). Several interviewees commented that this had enabled them to become more proactive in their dealings with health professionals:

'My son [5y] had a skin condition. I took him many times to the doctor but he couldn't help. So I went to Google [on phone] and browsed. I found some information about allergic reaction, so then I went back to the doctor and showed him the website. He wrote something that I should go to the hospital.'

(South Africa, 23y woman)

'I use the Internet to search for a lot of things. One day I spoke with my brother who is a nurse; I told him I have constipation. He said it

**Table 6**
Mobile phone use in connection with pregnancy and childbirth. (All respondents reporting at least one biological child).

| | Ghana | | Malawi | | S. Africa | | All (N = 688) |
|---|---|---|---|---|---|---|---|
| | Females (N = 127) | Males (N = 48) | Females (N = 206) | Males (N = 91) | Females (N = 146) | Males (N = 70) | |
| Called Health-worker | 7.9% | 4.2% | 2.9% | 5.5% | 8.9% | 12.9% | 6.5% |
| Arranged transport | 7.1% | 16.7% | 5.3% | 8.8% | 21.2% | 17.1% | 11.5% |

**Table 7**
Use of mobile phone to seek/receive health-related information in the preceding 12 months.

| | Ghana (N = 1568) | Malawi (N = 1544) | S. Africa (N = 1514) | All (N = 4626) |
|---|---|---|---|---|
| Number (%) using mobile phone to seek/receive health information | 140 (11.4%) | 95 (10.1%) | 397 (29.4%) | 632 (18.0%) |
| **Source of information** | | | | |
| Personal contact | 28 (1.8%) | 31 (2.0%) | 30 (2.0%) | 89 (1.9%) |
| Health professional | 20 (1.3%) | 13 (0.8%) | 14 (0.9%) | 47 (1.0%) |
| Internet search | 23 (1.5%) | 18 (1.2%) | 243 (16.1%) | 284 (6.1%) |
| Dedicated helpline | 2 (0.1%) | 1 (0.1%) | 4 (0.3%) | 7 (0.2%) |
| Phoned health-related radio/TV show | 39 (3.8%) | 21 (1.4%) | 25 (1.7%) | 105 (2.3%) |
| Solicited SMS 'health tips' | 35 (2.2%) | 14 (0.9%) | 39 (2.6%) | 88 (1.9%) |
| Unsolicited SMS tips/adverts | 65 (4.1%) | 34 (2.2%) | 140 (9.2%) | 239 (5.2%) |
| SMS from healthcare providers | 0 | 0 | 12 (0.8%) | 12 (0.3%) |
| **Health information sought** | | | | |
| Medicines | 29 (1.8%) | 24 (1.6%) | 61 (4.0%) | 114 (2.5%) |
| Healthcare providers | 7 (0.4%) | 7 (0.5%) | 24 (1.6%) | 38 (0.8%) |
| Specific symptoms/condition | 38 (2.4%) | 22 (1.4%) | 131 (8.7%) | 191 (4.1%) |
| Contraception/family planning | 2 (0.1%) | 6 (0.4%) | 24 (1.6%) | 32 (0.7%) |
| Pregnancy | 2 (0.1%) | 3 (0.2%) | 70 (4.6%) | 75 (1.6%) |
| Abortion | 3 (0.2%) | 5 (0.3%) | 46 (3.0%) | 54 (1.2%) |
| HIV/AIDS | 5 (0.3%) | 7 (0.5%) | 118 (7.8%) | 130 (2.8%) |
| Other STIs | 5 (0.3%) | 5 (0.3%) | 72 (4.8%) | 82 (1.8%) |

*may be piles so I quickly went to the internet to check the symptoms. The symptoms were exactly the same as mine so I quickly went to the doctor and told him I have got piles.'*

(South Africa, 24 y woman)

Others, however, became anxious when confronted with confusing or conflicting advice, and were unsure how to assess the accuracy and validity of information from different sources, as this young women's account illustrates:

*'My doctor tells me this, Google tells me something else, so I feel confused and worried: will I die? Lately, they were putting [IV drip] in me at the hospital but I don't always have money to go to hospital. So I go to Google to find if I can take some other medicines, like painkillers. Searching sometimes makes me worried because I get different information from the Internet and doctors, and I don't know which one to trust.'*

(South Africa, 18 y woman)

In Ghana and Malawi, where fewer young people have Internet-enabled phones, other information sources are more widely used. Mobile phones have made radio more directly accessible to many young people who, for the first time, can select which station to listen to rather than being restricted to whatever was playing on the main household/neighbourhood radio. In all three countries, radio (and TV) phone-in shows featuring healers are very popular with young people, particularly in Ghana where 59 survey respondents said that had called in (using a mobile phone). These programmes were also discussed enthusiastically in in-depth interviews:

*'I heard a herbalist speak about how he can cure people with all kinds of skin diseases. About 2 months ago, I had some skin rashes on my body; during that time I heard on my mother's phone [radio] that Royal Alata soap can cure all kinds of skin rashes. Immediately I took some money from my mother and went and bought some.'*

(Ghana, 14 y boy)

*'If I see a number on a TV screen, I can take the number and call it. One day, I woke and felt sick and running to the toilet. I was lying in bed watching TV. I saw a major prophet on TV so I called and asked for help. The prophet prayed for me. Since then, I have been calling day and night for protection from these demons.'*

(Ghana, 12 y girl)

In all three countries, SMS messages – both solicited and unsolicited – were another common source of health 'information'. Some network providers offer regular 'health tips' for subscribers and, in South Africa, some healthcare providers communicated with patients in this way. However, more often, young people (again especially in South Africa) received unsolicited messages and advertisements, often of unclear provenance and with dubious information on, for example, 'cures' for AIDS.

### 3.2.3. Healing through the phone

A few interviewees claimed not just to have received information, but to have been healed *directly* through the phone. In all three countries, high-profile charismatic 'pastors', 'prophets' and other faith healers have a significant presence on the radio and internet (see for example Shipley, 2009, re Ghana), and claim to transmit healing power directly through these technologies. Many young people follow these healers on their phones and a few claimed

positive therapeutic experiences, for example:

*'Sometimes I go to websites of prophets and pastors [..]. One day I was not feeling well so I searched for healing. There were prayers written on the website which I recited. I was healed of my headache.'*

(Ghana, 16 y boy)

*'I got terribly sick, this year beginning and I made a call to a pastor who then promptly prayed for me and I got healed right there. So you see that a phone saved me.'*

(Malawi, 23 y woman)

### 3.2.4. Phone-based income for healthcare expenses

Finally, mobile phones can facilitate healthcare *indirectly*, through enabling income generation. Only a few respondents had used earnings from phone-related business/work to meet healthcare expenses (13 in Ghana, 8 in Malawi, and 11 in South Africa) but, for those few, this could provide an important buffer in an emergency, as this young man's account illustrates:

*'On average, I earn about GHc10 a day [about £2] selling Vodafone airtime, but on a bad day I earn nothing. I saved about GHc1000 from the business with the intention of using it to further my education. However, my mother fell sick about 4 months ago. I spent almost all the money on her medical expenses, about GHc 800. The rest was used to cater for my siblings' needs since my mother was indisposed. Even though I could not go to school as planned, I am happy because my mother is alive and has begun to work again.'*

(Ghana, 19 y man)

Phones can also be sold to raise money. Although this happened only rarely (16 respondents in Malawi, six in Ghana and two in South Africa had sold their phone to meet healthcare expenses), *in extremis* it could make a difference.

### 3.3. Variation in practices, opportunities and constraints

The data above indicate variation in practices across countries, with South Africans more likely to use mobile phones to seek healthcare and information, particularly via the Internet, than those in Ghana or Malawi. Further analysis also reveals substantial *within*-country variation: Tables 8a–d. Older respondents reported more health-related phone use than younger ones in all three countries. There were marked rural–urban differences in Ghana and Malawi (but not South Africa), with those in rural settlements significantly less likely to use mobile phones for seeking healthcare and health-related information than those in urban/peri-urban settlements. Gender differences were only apparent in South Africa, where young women reported significantly more health-related phone use than men.

Some of this variation might be driven by differential need. For example, older respondents might shoulder relatively greater healthcare responsibility, and gendered expectations about caring roles may contribute to the differences observed in South Africa. However, it is unlikely that the marked urban-rural differences can be explained straightforwardly by differential need, since rural populations in all three countries have *greater* unmet healthcare needs than urban ones (Mills et al., 2012; Abiiro et al., 2014). Instead, differential access and opportunity are more likely explanations, as we explore below.

**Table 8**
Health-related mobile phone use: logistic regression analysis by country, gender, age group and settlement type.

| | Odds ratios (e^B) | | |
| --- | --- | --- | --- |
| | Ghana N = 1568 | Malawi N = 1544 | South Africa N = 1514 |
| **(a) For own illness (preceding 12m):** | | | |
| *Gender [REF: Male]* | | | |
| Female | 1.01[NS] | 0.93[NS] | 1.58*** |
| *Age [REF: 8–13 y]* | | | |
| 14–18 y | 4.86*** | 5.10*** | 2.24*** |
| 19–25 y | 14.28*** | 12.17*** | 3.45*** |
| *Settlement type [REF: Remote Rural]* | | | |
| Rural/services | 1.25[NS] | 1.25[NS] | 1.14[NS] |
| Peri-urban | 2.43*** | 5.15*** | 1.41* |
| Urban | 2.66*** | 4.81*** | 1.19[NS] |
| **(b) For *another person's* illness (preceding 12m)** | | | |
| *Gender [REF: Male]* | | | |
| Female | 0.86[NS] | 0.84[NS] | 1.69*** |
| *Age [REF: 8–13 y]* | | | |
| 14–18 y | 3.76*** | 5.99*** | 2.97*** |
| 19–25 y | 12.68** | 17.21*** | 4.60*** |
| *Settlement type [REF: Remote Rural]* | | | |
| Rural/services | 1.27[NS] | 1.18[NS] | 1.13[NS] |
| Peri-urban | 1.76** | 4.03*** | 1.59** |
| Urban | 1.53* | 4.75*** | 1.19[NS] |
| **(c) Health-related information (preceding 12m)** | | | |
| *Gender [REF: Male]* | | | |
| Female | 0.73[NS] | 0.76[NS] | 1.35* |
| *Age [REF: 8–13 y]* | | | |
| 14–18 y | 8.18*** | 22.14*** | 5.30*** |
| 19–25 y | 37.29*** | 51.13*** | 7.88*** |
| *Settlement type [REF: Remote Rural]* | | | |
| Rural/services | 1.60[NS] | 1.77[NS] | 1.36[NS] |
| Peri-urban | 2.29** | 6.49*** | 1.89** |
| Urban | 3.73*** | 8.27*** | 2.24*** |

| | Odds ratios (e^B) | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| | Called health professional | | | Arranged transport | | |
| | Ghana N = 175 | Malawi N = 297 | S.Africa N = 216 | Ghana N = 175 | Malawi N = 297 | S. Africa N = 216 |
| **(d) Assistance for pregnancy or childbirth (ever): all survey respondents with ≤1 biological child** | | | | | | |
| *Gender [REF: Male]* | | | | | | |
| Female | 1.58[NS] | 0.57[NS] | 0.72[NS] | 0.38[NS] | 0.39[NS] | 1.33[NS] |
| *Settlement type [REF: Rural]* | | | | | | |
| Urban/peri-urban | 4.19* | 6.21* | 3.90* | 1.07[NS] | 12.72** | 1.28[NS] |

***p < 0.0005; **p < 0.005; *p < 0.05; NS not significant.
N.B. Age is excluded as almost all those with own children were in the oldest age group. Settlement type is reduced to two categories because of the small sample size.

### 3.3.1. Phone ownership, access and usability

First, health-related phone use is, of course, predicated on having (access to) a mobile phone. As indicated above, phone ownership varies between and within countries, with those in rural Malawi and Ghana least likely to own a phone. However, ownership does not equate straightforwardly with access or use. Widespread phone sharing enables some non-owners to have *access*. On the other hand, to be *usable*, a phone needs to be in working order, with a charged battery, airtime (phone credit) and a network signal, none of which can be taken for granted.

Phones breaking down are a big issue, especially in resource-poor settlements where cheap second-hand and black-market phones circulate widely. Altogether, 1316 survey respondents (28.5% of the whole sample and 52.8% of those who had ever owned a mobile phone) reported having a phone stop working beyond repair. Maintaining airtime was also a serious challenge for young people with limited resources across all study sites, with those in rural areas typically paying a 10–20% premium. Overall, more than

**Table 9**
Proportions of mobile phone owners with airtime and battery charge at time of survey.

| | Ghana (N = 555) | Malawi (N = 295) | S. Africa (N = 943) |
| --- | --- | --- | --- |
| **% phone battery charged** | **78.8%** | **76.8%** | **81.2%** |
| Urban | 91.9% | 84.2% | 83.7% |
| Peri-urban | 86.2% | 81.1% | 81.6% |
| Rural/services | 62.2% | 51.5% | 79.5% |
| Remote rural | 50.0% | 58.3% | 79.1% |
| **% with airtime** | **63.8%** | **61.0%** | **56.1%** |
| Urban | 65.9% | 60.0% | 55.5% |
| Peri-urban | 64.4% | 65.3% | 57.9% |
| Rural/services | 65.7% | 57.6% | 50.9% |
| Remote rural | 53.9% | 55.6% | 60.9% |
| **% network coverage in home/ neigh'hood** | **95.6%** | **95.8%** | **96.5%** |
| Urban | 100.0% | 100% | 100% |
| Peri-urban | 96.2% | 98.9% | 96.6% |
| Rural/services | 85.8% | 77.8% | 96.7% |
| Remote rural | 95.9% | 82.8% | 91.5% |
| **% usable phone (airtime + battery + network)** | **50.2%** | **47.7%** | **44.0%** |
| Urban | 62.9% | 51.4% | 46.7% |
| Peri-urban | 55.6% | 57.0% | 44.7% |
| Rural/services | 34.0% | 25.9% | 40.0% |
| Remote rural | 27.6% | 20.7% | 41.4% |

two-fifths (40.7%) of phone-owners had *no airtime at all* at the time of survey, while fewer than a fifth (17.2%) had enough to make all but the briefest call: Table 9. Many reported sacrificing other important items in order to purchase airtime: almost half (49.3%) of survey respondents who had purchased phone credit in the week preceding the survey reported having foregone their school lunch (13%), other food (21%) or other basic needs (clothes, school books, soap or medicines) to enable this. Keeping the phone battery charged could present further difficulties, particularly for those in rural settlements in Ghana and Malawi without mains electricity. Rural residents in all three countries were also less likely to have reliable network coverage at home or in their neighbourhoods than urban/peri-urban residents.

Altogether, fewer than half (47.7%) of all phone-owners had a phone that was *usable* (for communication) at the time of survey; for the other 52.3%, some combination of lack of airtime, battery charge and/or network coverage rendered them temporarily incommunicado. In all three countries, there were marked rural–urban (and age) differences in phone *usability*, over and above differences in *ownership* (Table 10), compounding communication problems in rural areas where, not surprisingly, we most often heard stories of people unable to access urgent healthcare because of phone failure.

**Table 10**
Having a 'working phone': all mobile-phone owners, logistic regression analysis by country, gender, age group and settlement type.

| | Odds ratios (e^B) | | |
| --- | --- | --- | --- |
| | Ghana N = 544 | Malawi N = 287 | South Africa N = 956 |
| **Gender [REF: Male]** | | | |
| Female | 0.69[NS] | 1.73[NS] | 0.66[NS] |
| **Age [REF: 19–25 y]** | | | |
| 8–13 y | 0 (none) | 0 (none) | 0.21*** |
| 14–18 y | 0.29*** | 0.49[NS] | 0.51*** |
| **Settlement type [REF: Rural]** | | | |
| Urban or peri-urban | 1.77** | 4.81** | 1.47* |

***p < 0.0005; **p < 0.005; *p < 0.05; NS not significant.

### 3.3.2. Phone contacts

Having the right *people* to contact is a second key requirement. While calling a close family member or neighbour can sometimes suffice, certain situations require mobilising contacts with better financial resources or a 'gate-keeper'. Personal connections with a health professional — or even someone employed as a cleaner or security guard at a health facility — can be particularly useful when access through more formal channels is limited; a phenomenon described by Whyte (2014) as 'technical know-*who*' and widely documented elsewhere in Africa (Whyte, 2014; Sodemann et al., 2006; Prince, 2014).

Malawians — particularly those in rural areas — reported having fewer contacts stored on their phones than those in South Africa or Ghana: Table 11. Overall, nearly a quarter (23.6%) of phone-owners had a health-worker's personal number on their phone, with rural—urban differences particularly marked in Malawi. Most of these contacts were either a family member who also happened to be a nurse or community health-worker or a phone number obtained from a previous healthcare consultation, both of which are likely to favour urban residents. Nearly three-fifths of Malawians reported having a contact living in a different country, compared with two-fifths in Ghana and 14% in South Africa. However, the majority of these were family members working as subsistence farmers in neighbouring Zambia or Mozambique or low-paid employees in South Africa, whereas a relatively high proportion of Ghanaians — particularly those in urban/peri-urban settlements — had phone contacts in Europe or North America (perhaps with greater financial resources).

Overall, a fifth of survey respondents (20.3%) were deemed 'well-connected' (for healthcare purposes), defined here as having at least 50 phone contacts altogether, including at least one overseas (outside Africa) contact *and/or* one health professional (doctor, nurse or community health-worker). As with phone access/usability, there were clear urban-rural (and age) differentials in connectedness, particularly in Ghana and Malawi: Table 12.

### 3.3.3. Phone expertise

Finally, effective health-related phone use requires appropriate *skills.* Even just knowing how to manipulate a basic phone to make

**Table 11**
Phone contacts: all mobile phone owners, by country and settlement type.

|  | Ghana (N = 555) | Malawi (N = 295) | S. Africa (N = 943) |
|---|---|---|---|
| **Median no. phone contacts** | **50** | **42** | **45** |
| Remote rural | 50 | 30 | 40 |
| Rural/services | 51 | 24 | 50 |
| Peri-urban | 45 | 50 | 51 |
| Urban | 50 | 50 | 46 |
| **% with ≥ 1 overseas contact(s)** | **39.7%** | **59.5%** | **14.1%** |
| Remote rural | 25.0% | 59.3% | 9.0% |
| Rural/services | 30.2% | 73.1% | 13.6% |
| Peri-urban | 40.6% | 58.7% | 20.9% |
| Urban | 49.5% | 57.7% | 11.6% |
| **% with ≥ 1 contacts outside Africa** | **30.2%** | **6.2%** | **5.8%** |
| Remote rural | 14.5% | 0 | 2.7% |
| Rural/services | 14.4% | 3.8% | 5.3% |
| Peri-urban | 33.1% | 4.4% | 11.1% |
| Urban | 42.2% | 9.6% | 3.1% |
| **% with health professional contact** | **29.0%** | **26.5%** | **19.6%** |
| Remote rural | 18.4% | 6.9% | 14.1% |
| Rural/services | 30.2% | 7.4% | 18.3% |
| Peri-urban | 33.1% | 35.5% | 21.2% |
| Urban | 29.2% | 28.3% | 23.0% |

**Table 12**
Being 'well-connected' (minimum of 50 phone contacts overall, including at least one overseas and/or health professional): logistic regression analysis, all mobile-phone <u>owners</u>, by country, gender, age group and settlement type.

| | Odds ratios ($e^B$) | | |
|---|---|---|---|
| | Ghana N = 544 | Malawi N = 287 | South Africa N = 956 |
| **Gender [REF: Male]** | | | |
| Female | 1.39[NS] | 1.54 [NS] | 0.77[NS] |
| **Age [REF: 19–25 y]** | | | |
| 8–13 y | 0.27* | 0 (none) | 0.30*** |
| 14–18 y | 0.60* | 1.34[NS] | 0.67*** |
| **Settlement type [REF: Rural]** | | | |
| Urban or peri-urban | 3.48*** | 3.68*** | 1.30* |

***p < 0.0005; **p < 0.005; *p < 0.05; NS not significant.

a call can prove crucial in an emergency, as the earlier examples illustrate. However, 15% of survey respondents (ranging from 40.0% in rural Malawi to 4.0% in urban South Africa), had never used even a basic mobile phone and were therefore unlikely to have acquired these skills. More sophisticated IT expertise is needed to navigate the complex and often opaque online world and assess the likely trustworthiness of information, while using this information to engage in constructive dialogue with a health professional requires considerable self-confidence. These qualities were not measured formally in the survey but interviews suggest that older and urban-dwelling respondents, with greater experience of using the technology and interacting face-to-face with health professionals, might have the edge here too.

## 4. Discussion

It is clear that mobile phones are becoming an important part of young people's health-seeking repertoires in Ghana, Malawi and South Africa. These young people are not waiting passively for m-health to come to them; they are already *doing* m-health *informally*: using mobile phones creatively and strategically to try to secure healthcare. Through their practices, young people are effectively laying claim to a digitally-mediated form of therapeutic citizenship. Unlike the collective political action of patient groups and activists described by Nguyen (2004, 2010) or Biehl (2009), the focus of this quest is *individual*. Young people are attempting to participate in a geographically-dispersed, largely unregulated healthcare arena, exercising a *de facto* right to an array of therapeutic possibilities, while bearing individual responsibility for getting it right. This fits well with current neoliberal rhetoric that emphasises and endorses patient 'empowerment', choice and responsibility. However, the shifting responsibility for healthcare to (young) individuals in this way comes with serious — and unevenly distributed — constraints and risks.

First, not everyone has the wherewithal required to enter this brave new world. To co-opt the mobile phone as a therapeutic tool first requires having access to a working, usable phone (with airtime, battery charge and network signal) and the financial resources to maintain this without sacrificing other basic needs. It also requires having both 'technical know-*how*' and 'technical know-*who*' (Whyte, 2014): the right contacts (extensive, well-resourced and well-positioned) and skills to access relevant information and help. All of these are unevenly distributed, with those in rural areas of resource-poor countries most disadvantaged.

Second, the unregulated nature of the digital world presents difficulties and risks, even to those with reasonable technical know-*how/who*. While some young people reported positive experiences, many others struggled to navigate a potential minefield of misinformation and were unsure and anxious about what/whom

to trust, particularly in South Africa where the volume of unsolicited health information is greatest. The interview data suggest that young people may be duped by convincing-sounding healers on the radio or Internet into buying their products (see also De Freitas et al., 2013). While these products may not *necessarily* be harmful (although they might be), young people risk spending their already-limited resources on unnecessary and/or inefficacious medicines, perhaps at the expense of seeking *effective* treatment. Particularly worrying is the (mis)information on serious illnesses like HIV/AIDS.

Third, although mobile phones (especially when coupled with the Internet) have undoubtedly opened up new 'virtual therapeutic landscapes' (Hampshire et al., 2011) that extend beyond geographical locale, when it comes to health *care* and specific *diagnosis* (rather than more general *information*), most study participants still relied largely on locally-available services. Where these are unavailable, unaffordable or ineffective, 'informal m-health' efforts (for example, calling an overseas relative for money, or researching a condition) may prove futile.

Ironically, it is in impoverished rural areas, where the need to overcome healthcare barriers is greatest, that the reach of 'informal m-health' has (so far) been most limited. Digital technologies tend to map onto existing (often deeply-rooted) social inequalities which become re-configured but not erased. However, this process is neither socially nor technologically deterministic. As Horst and Miller (2006) noted in relation to Jamaica, it is the *specificities* of communicative ecologies, which comprise both local cultural forms and the wider geopolitics of travel and communication, that shape what both young people and mobile phones *become* through their appropriation and co-option. Thus, in Ghana, a culture of public testimonial or 'confession', associated with the growth of Pentecostalism (Meyer, 2004), becomes mirrored in the phenomenon of the call-in show. And the different patterns of overseas contacts in the three countries can be understood within the particular historical trajectories of labour migration in southern Africa and (post) colonial ties.

Moreover, although 'communicative ecologies' continue to be shaped by structural inequalities that are both reproduced and reconfigured, the situation is more complex, contingent and shifting than that implied by the term 'digital divide'. Instead, it might be more useful to think in terms of differential access to 'digital capital', which includes not just the technology itself but also the wherewithal (personal networks, skills, resources, etc.) needed to optimise its use. The concept of digital capital is apt because of its convertibility to other forms of capital (Bourdieu, 1986): economic, cultural, symbolic and − in relation to healthcare − bodily capital. Unlike a binary 'divide', digital capital can be multi-faceted and unstable over time, and individuals are not unambiguously on one 'side' or another. For example, some young people made considerable sacrifices to obtain airtime but managed to secure vital help in a crisis; others struggled to evaluate the reliability of information but nonetheless used this to negotiate more effectively with health professionals. However, the fact of its convertibility can generate reinforcing cycles of disadvantage, whereby a lack of digital capital feeds into, and is perpetuated by, a lack of other forms of capital with impacts on (*inter alia*) health(care).

## 5. Conclusion and implications

To summarise, mobile phones have the potential to be an important therapeutic resource, and are already being used creatively by young people in our study to research and secure healthcare. However, their efforts may be compromised by limited access to the technology, lack of 'digital capital', uncertainty and poor health service provision, all of which are experienced most intensely by those in impoverished rural settlements.

Understanding this is important if we want to harness the potential for mobile phones to impact positively on young people's health, particularly in the Global South. The potential for m-health to transform formal healthcare provision, especially in geographically-remote areas, is huge. But, for now at least, this is far less significant for many young people than the informal, 'do-it-yourself', m-health practices described here. We therefore need to think urgently about how young people might be facilitated to use mobile phones effectively and safely in relation to healthcare.

An obvious pre-requisite is improved access to digital technology, particularly in rural areas without reliable network coverage or electricity. Over the course of our study, solar chargers were becoming much more widespread in the rural sites, particularly in Malawi and Eastern Cape (South Africa). Governments could also play a more proactive role in incentivising network operators to improve rural coverage (see Buys et al., 2009). However, access alone is not enough: young people also need to be facilitated to build appropriate digital capital to use mobile phones to best (therapeutic) effect.

What might this mean in practice? First, appropriate, up-to-date education (in-school and out-of-school) could play an important role. Currently, schools in Ghana, Malawi and South Africa only cover phone/e-safety and internet skills in a cursory, piecemeal fashion (Porter et al., 2015). Making these a core part of national curricula could help young people to use IT resources more effectively, without being duped or unnecessarily alarmed by misleading/biased information. This should go hand-in-hand with the development of web-based resources that give accurate, reliable, *realistic* and up-to-date health information/advice. Tighter regulation of medical advertisements, especially those targeting young people, is another issue that deserves careful consideration. None of this should, of course, distract from the urgent need to accelerate investment in Universal Health Coverage and particularly youth-friendly services, without which m-health (formal or informal) lacks foundation.

Both the digital and medical worlds are changing rapidly in ways that are hard to predict. It is crucially important to work in partnership with young people, who are often at the forefront of emerging practices and who know better than anyone else what these might mean for them. Engaging with adolescents and young people as responsible therapeutic citizens, with legitimate rights and responsibilities commensurate with their cognitive abilities and social situations, is an absolute pre-requisite to facilitating safer and more effective (digitally-mediated) health-seeking practices.

## Acknowledgements

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