

# HEALTH SYSTEMS STRENGTHENING PRACTICE SPOTLIGHT

## DIGITAL SOCIAL AND BEHAVIOR CHANGE IN HSS

Strengthening health systems through social and behavior change interventions that use digital technologies

### DIGITAL HEALTH SERIES

Public health systems increasingly use digital technologies to improve decision-making, planning, implementation, and evaluation of health services. The rapid pace of digital innovation provides ongoing opportunities for governments and their partners to advance the accountability, affordability, accessibility, and reliability of high-quality health services. The Practice Spotlights Digital Health series supports USAID's Vision for Health System Strengthening 2030 and Vision for Action in Digital Health by exploring the ways in which digital transformation can contribute to countries' health system strengthening efforts.

### INTRODUCTION

A growing number of country governments, implementers, and funders are adopting digital health tools and systems to strengthen health system delivery and improve health outcomes for patients around the world. Digital health is the systematic application of information and communications technologies, computer science, and data to promote informed decision-making within the health sector.<sup>1</sup> In 2020, the World Health Assembly adopted the WHO Global Strategy on Digital Health, calling on countries to harness digital health to transform their health sectors by converting analogue health information systems into virtual and digital systems.<sup>1</sup>

The digital revolution also resulted in new efforts to incorporate digital health technologies into social and behavior change (SBC) programming. SBC is a systematic, evidence-driven approach to improve and sustain changes in behaviors, norms, and the enabling environment, and is a foundational and critical component of effective and sustainable health system strengthening (HSS) programming.<sup>2</sup>

As outlined in USAID's Vision for Health System Strengthening 2030, SBC is critical to strengthening health systems and achieving the Sustainable Development Goals, particularly target 3.8, universal health coverage.<sup>3</sup> Integrating SBC into HSS initiatives can shape demand for health services, enable supportive behaviors among health providers who are essential to quality care, and spur a shared responsibility for health among patients, providers, and other health system actors. HSS practice can integrate SBC methodologies and approaches to address the social and behavioral drivers that affect health system performance and accelerate or impede positive health outcomes.

<sup>1</sup> Digital transformation involves converting manual and paper-based processes of data collection, reporting, and analysis into a digital format, and includes reengineering and optimizing organizational processes, culture, and client experiences.

This brief explores ways in which digital tools and systems can be used successfully and responsibly to advance SBC interventions in support of health system strengthening, and provides recommendations for future programming and areas of research.

## DIGITAL TOOLS FOR SOCIAL AND BEHAVIOR CHANGE

Digital tools for SBC are increasingly common for use in patient diagnosis, primary care interventions, and self-management of chronic diseases.<sup>4</sup> SBC interventions are more frequently integrated in vertical health programs, and are also used in combination with digital tools to advance HSS goals.<sup>5</sup> Digital tools have the potential to empower individuals to take an active role in improving their health behaviors and outcomes; to enhance the provision of equitable, high-quality care; to help health system policy makers and other stakeholders understand, monitor, and act upon population health beliefs, knowledge, and needs; and to contribute to changing behaviors at scale.

For example, initial research suggests that online and virtual mechanisms for SBC communication are at least as effective for enabling individual behavior change as

conventional approaches—and even more so when combined with in-person approaches.<sup>6</sup> Digital interventions have been shown to improve self-management of chronic conditions, preventative health behaviors, and delivery of care.<sup>7</sup> Although it is not yet fully understood how SBC theory translates to digital SBC interventions,<sup>8,9</sup> digital tools offer new opportunities for changing or supporting the behaviors of health system actors.

Behavior change interventions are most effective when they engage individuals via multiple channels and levels, including through passive (e.g., SMS message) and active (e.g., virtual supervision) digital approaches. In a randomized controlled trial in urban Bangladesh, diabetes patients received interactive voice calls to improve medication adherence and lifestyle habits. Those who received the messages significantly improved adherence to dietary recommendations and control of blood glucose, among other indicators of health, demonstrating the effectiveness of phone reminders for managing chronic health conditions.<sup>10</sup>

Digital tools also provide new opportunities to improve our understanding of behavioral drivers. SBC practitioners frequently rely on self-reported answers to questions about health habits, knowledge levels,

### POTENTIAL BENEFITS

In the right contexts and after careful assessment, digital tools for SBC in HSS can:

**Be less labor intensive:** The use of machine learning and predictive analytics can promote curated digital health interventions that are both more frequent and less labor-intensive.<sup>11</sup>

**Be more affordable:** The reach of digital tools is generally thought to make digital SBC interventions more cost-effective than many in-person methods, increasing scale without steep costs.<sup>12</sup>

**Achieve higher reach:** Digital tools for SBC promote more frequent—and often more convenient—interactions with individuals when and where they prefer.

**Increase interaction with others:** Digital tools can be unidirectional, feeding individuals targeted information, or they can be more interactive, engaging users in online discussions, peer support groups, and provider dialogues.<sup>13</sup>

**Be more scalable:** Digital tools have the potential to reach more people,<sup>14</sup> compared to traditional SBC interventions, which are often logistically difficult and expensive to scale.

**Improve data:** The type and volume of data made available by digital tools applied to SBC programming is unprecedented and presents an opportunity to better understand human behavior. By collecting data in real time and using methods that require less self-reporting, practitioners can analyze large datasets to better understand shifts in knowledge, attitudes, and behaviors, and the influence of external factors.<sup>15</sup>

channels of engagement, user preferences, and changes in behavior. These are foundational but not always accurately reported. Many digital and data tools can passively collect huge datasets on individuals' behaviors, attitudes, and knowledge as they interact with their devices. Sometimes referred to as digital phenotyping, the real-time calculation of individual-level human phenotypes using these tools can deliver objective, data-driven measures of behavior that can then be used to design more targeted interventions.<sup>16</sup>

Digital tools can also facilitate at-scale SBC program monitoring and learning across the health system. "Social monitoring" quantifies social media users' engagement with various topic areas, programs, and products by measuring reactions. Analyzing the volume, frequency, and sentiment behind conversations on social media can help detect patterns in beliefs, drivers of conversations, audience affinities, and misinformation. Used in combination with other traditional monitoring, evaluation, research, and learning (MERL) techniques, it can offer data-rich insights into individuals' true behaviors and learning environments.

Social monitoring tools can also offer more granular data than a conventional survey, determining spikes in engagement, conversation patterns, flashpoints of discussion, and general sentiment toward different topic areas (see Box I). These tools enable behavior change practitioners to analyze data retrospectively or prospectively, and with speed. Practitioners can collect rapid insights to more quickly move from design to implementation and the scale-up of interventions across relevant health system stakeholders.<sup>17</sup> It is also critical for countries and health programs to make use of existing digital global goods software,<sup>19</sup> which can be adapted for use in a variety of health landscapes, offering more cost-effective measures without reinventing the wheel.<sup>ii</sup>

### BOX I: SOCIAL MONITORING IN THE RISE II PROJECT

The Resilience in the Sahel Enhanced (RISE) II project employs behavior change to improve service quality, foster more resilient health systems, and improve maternal newborn and child health and nutrition (MNCHN) outcomes among vulnerable populations. RISE II used social monitoring and social listening to determine priority needs among its target audiences and improve its programming. Implementers tracked social media engagement to identify the leading beliefs, attitudes, and social norms that dominated online conversations.<sup>20</sup> Social listening also provided candid feedback that may not have been conveyed in a traditional survey or focus group, which helped the RISE II project staff improve MNCHN service quality.<sup>19</sup>

## CASE STUDIES

### Digitalizing Supportive Supervision in Tanzania

To enable a strong health system, health workers must be able to monitor the performance of their facilities. Until recently this process has been fragmented and paper-based in Tanzania. Health managers and frontline health workers had limited visibility into how their hospitals and clinics were performing against health system targets.

Under the Data Use Partnership (DUP), the Government of Tanzania and PATH are supported by the Bill & Melinda Gates Foundation to improve the national health care system through better use of health information. A cornerstone of DUP has been the development of a facility supportive supervision system to be used by health managers, district health officials, and frontline health workers to systematically link performance data and supervision recommendations. In the past, facilities struggled to improve their quality ratings because of a fragmented paper-based system of checklists for different health areas. This made it difficult for health workers to implement recommendations.

<sup>ii</sup> Digital global goods software are free and open-source tools that can be used to manage, analyze, or transmit health-related data in several settings, countries, and contexts.

The Afya Supportive Supervision System (AfyaSS) updates and digitalizes these processes, making it easier to assess facility performance at a systems level.

AfyaSS was designed using principles of user-centered design. Beginning in 2018, the Government of Tanzania and PATH embarked on a participatory design process that included a desk review of existing guidelines and tools, field visits, stakeholder workshops, and user advisory groups to identify common challenges and system requirements of the future AfyaSS.

AfyaSS harmonizes the supervision process, creating a single, consolidated action plan. It also ensures that health workers at the facility level, managers at the regional level, and policy makers at the national level have reliable, real-time access to information on the performance of Tanzania's health system. AfyaSS incorporates critical components of behavior change, including system notifications to remind health workers about facility targets and progress toward health system goals, linking them to data from previous visits. It also includes dashboards to help visualize improvements and generates action plans based on the data collected during supervisory visits. Offline components allow for use of the system in remote areas with limited connectivity. Together, these features enable health workers to act on the performance data made available to them.

A critical learning from the development and implementation of AfyaSS has been the importance of participatory design principles. The government employed user advisory groups comprised of key health actors, software designers, and engineers to map the previous paper-based system and redefine workflows in support of health system strengthening. Input from users, for example, indicated that health managers often struggled to verify if a supervisory visit had taken place. Supervisors sometimes falsely reported visits and paper-based systems did not allow for any means to substantiate these claims. In response to this persistent challenge, AfyaSS was designed to include geotagging features that log the start and end locations of a visit, prompting users to begin their evaluation when they are in the vicinity of their assigned health facility. These

quality control measures help to hold supervisors accountable.

AfyaSS and its behavior change components are contributing to a culture of care that is focused on data-driven quality improvement. Health managers were interviewed about the impact of the system on their oversight roles and facility performance. The health managers cited the efficiencies of the digital system and how consolidated datasets made it easier to develop an accurate picture of a health facility's performance.

Dr. Charles Migunga, Regional Quality Improvement Focal Person for Arusha, shared: "The change is what I'm most excited about. Instead of a bundle of papers, I have a tablet. The technology is what makes the supportive supervision system appealing and thus pushes us to make sure we frequently log-in to see the supervisions conducted, action items, and to follow up to see if they were taken care of, and to what extent the issues were resolved."

AfyaSS has been rolled out to all 26 regions in Tanzania and is actively in use in 24, with plans to continue training users and implementing change management strategies to increase system use.

### Integrating Digital Financial Services and Digital Tools in Kenya to Build Health System Resiliency

Financial protection along with increasing coverage of quality service provision are important dimensions of resilient, sustainable health systems. The increased availability of digital financial services (DFS) provides opportunities to accelerate progress towards health systems outcome goals of improving equity, quality, and resource optimization.

DFS includes a range of digital financial transactions, including payment, banking, and insurance services via internet, mobile phone, and other digital and data tools. Building on the 2019 publication "The Role of DFS in Accelerating USAID's Health Goals," USAID's Bureau for Global Health commissioned studies on the role of DFS in advancing financial protection and supporting improved health system performance, and better

understanding the factors that make solutions successful, and the role digitization can play in enhancing and leveraging these factors.

An extensive literature review of the evidence on DFS conducted by USAID's Local Health System Sustainability Project<sup>21</sup> identified best practices for engaging vulnerable individuals in more equitable financial protections. Of particular interest are the non-financial and behavioral elements of expanding health care access and choice for patients, such as understanding the behavioral barriers to saving for health insurance.

Corresponding case studies developed by MSH under Digital Square explored the Innovative Partnership for Universal Sustainable Healthcare (i-PUSH) initiative, which used mobile technology to deliver better quality care to Kenyan women and their families, by enrolling them in a national hospital insurance fund through the M-TIBA platform. Women were digitally enrolled on a rolling basis by trained community health workers who also provided simultaneous health education.

The program uses DFS initiatives to address low health insurance coverage and the steep costs of unplanned health care. It also responds to the high rates of uninsured, impoverished women who are often exploited by fee-for-service models. M-TIBA, a mobile health wallet launched in 2015, offers health-specific payment services that encourage health savings. M-TIBA funds can be used in any facility that accepts the network and allows people to save, share, and borrow at very low costs. In addition to its use for out-of-pocket care, the program offers nudges or timely reminders to pay insurance premiums. The digital wallet enables users to review in real-time their benefits, submit medical claims, and allows for quick same-day disbursement of claims.<sup>22</sup> M-TIBA has also increasingly been used by donors, insurers, and implementing partners to offer health care vouchers and low-cost insurance plans. The DFS initiative helped change the way people, even from low-income families, look at health care payments. It also promoted a culture of saving by encouraging families to put aside small amounts regularly.

Findings from DFS initiatives have also reinforced the importance of building on the existing ecosystem to help bridge the digital divide for some households, including through mobile phone agents, community health volunteers, and other health actors. In the i-PUSH program in Kenya, for example, community health workers helped buttress the DFS initiative with health education and basic financial literacy for families, providing guidance on the importance of health insurance and the enrollment process.

DFS initiatives can transform the way health care is delivered and reach disadvantaged and impoverished populations to promote more affordable, accessible health.

## IMPLEMENTATION CONSIDERATIONS

Digital tools and systems can be used successfully and responsibly to advance SBC interventions in support of health system strengthening. The AfyaSS and DFS examples offer the following key lessons for implementing digital SBC interventions in different contexts. Each lesson includes recommendations for development and implementing partners to consider throughout the design, implementation, and monitoring of digital SBC for HSS.

**A design approach with the user at the center ensures that digital SBC interventions are responsive to HSS actors.**

Tailoring communication messages and channels to specific audience segments can enhance the relevance of the information presented and produce better health outcomes. Digital tools present an unprecedented opportunity to deliver complex, personalized interventions based on rich data streams and customizable formats. However, it is critical that digital SBC interventions build in opportunities to rapidly iterate their digital tools to respond to their real-world use. Unlike in-person SBC interventions which may be able to adapt to a scenario in person, digital tools need to account for different user scenarios from the outset. There has been an overall uptick in smartphone and



mobile use, but user habits are uneven between different genders, age ranges, and geographies.<sup>23</sup>

As with traditional methods of SBC, digital SBC programming should consider the appropriate framing for messages, frequency, tone, and voice. It's also important to consider the channels, timing, and modes of influence; messages must come from a trusted source. Some audiences may require sustained, in-depth engagement, whereas others benefit from context-triggered prompts or just-in-time interventions that engage users for crucial timepoints. Because most existing research on designing digital SBC interventions is focused on the patient experience, future research is needed on designing digital SBC interventions for other health actors, such as providers, health managers, and policy makers.

### Digital SBC interventions are often enhanced with interactive components.

While early research indicates that online interventions are at least as successful as face-to-face approaches, the most effective SBC interventions emulate some component of traditional in-person interventions. Retaining some human input has been shown to enhance engagement with HSS actors, leading to more transformative behavior change.

Practitioners should consider the right combination of automated digital interventions and digitally facilitated person-to-person interactions for behavior change. While digital tools such as SMS reminders allow for important channels to encourage adherence to healthy behaviors, digital person-to-person interventions (online peer support, forums, virtual coaches, etc.) engage users personally and directly and can enhance adherence to an even greater degree.

Digital person-to-person interventions have been shown to foster motivation, identify commonalities between users, and encourage adherence to health-seeking behaviors. A meta-analysis conducted of digital person-to-person initiatives revealed larger effect sizes than comparable self-guided online programs. This is attributed to the greater accountability, feedback loops, and deeper social support that human input allows.<sup>24</sup>

The benefits can also extend to other actors within the health system. Future programs should consider the roles of these different types of digital SBC interventions for health system strengthening.

### Social listening and social monitoring can offer data-rich insights into actual behaviors.

As people increasingly connect over social media, social listening and social monitoring can offer important insights to policy makers, implementers, and health providers that may supplement more traditional MERL methods within HSS SBC programs. Social platforms are increasingly frequented by a range of health system actors, and social listening can be a flexible and powerful tool for collecting valuable feedback on different topics.

Limitations should also be considered when incorporating social listening or social monitoring. Social media users are not usually representative of the general population, so their viewpoints may not reflect the sentiment of target audiences.<sup>25</sup> Privacy features are an important safety net on social media, but can also make it difficult to discern who is posting, and bots have been known to spread false messages and generate confusion on social media. Finally, while social media can foster greater transparency and candor, people are still subject to social pressures online.

### Digital SBC interventions require thoughtful metrics.

While digital technologies provide expanded opportunities for data generation and analysis, understanding behavior change within a health system likely requires the use of multiple approaches. Digital SBC interventions have the potential to produce an unprecedented amount of data to test SBC theories and better understand human behavior, but engagement with digital technologies is complex and successful behavior change can't be measured by digital usage alone. Likes, clicks, and pageviews are frequently used as social media metrics, for example, but there is a temptation to equate this engagement with shifts in attitudes, knowledge levels, and health-seeking behaviors. This incorrectly assumes that any amount of

user engagement with digital tools leads to the intended outcomes of an intervention, and that higher engagement will lead to better outcomes.

A growing community of researchers are advocating for a better understanding of how digital engagement may influence effectiveness.<sup>26</sup> Implementers should consider measures of engagement that take into account user satisfaction and distinguish between “big E” engagement and “little e” engagement.<sup>27</sup> “Little e” refers to engagement with the digital behavior change intervention and the context for exposure (such as time spent with an app, logins, clicks, or swipes) whereas “big E” refers to engagement with the health behavior of interest and represents the desired outcome of these digital interventions. Better metrics, definitions, and research on the different dimensions of engagement will help in designing more successful interventions.

### Digital SBC interventions must implement data ethics, regulations, and standards to equitably reach HSS actors and protect health system data.

Digital technologies promise better, more available health data, but also present new questions on the ethics and regulations of this data and of digital platforms more broadly. Any effective SBC intervention must weigh the risks and ethics of using digital technologies to promote behavior change. Digital SBC interventions may use online forums and channels that have also been used to spread false and misleading

information. There are also persistent discrepancies in access to and use of digital devices, which could result in inequitable access to health programs and content if not carefully addressed. Young audiences, particularly girls and women, often don't have access to their own mobile phones and so use their family's or friends' devices.<sup>28</sup> Online platforms should include moderation plans to simultaneously prevent false or harmful content from spreading, while also enabling more equitable access to important information and tools. Additional guidance and a framework for understanding the risks associated with development data are available in “Considerations for Using Data Responsibly at USAID.”<sup>29</sup>

Relatedly, one of the advantages of digital tools and systems is their ability to collect information passively and continuously without the overt engagement of their users. When this data is used to develop a digital or behavioral phenotype for users, it risks becoming exploitive. Particularly in low- and middle-income countries, data privacy concerns may be a new concept for first-time digital users. Coupled with the nascent data privacy and security governance in most countries, this can put vulnerable populations at even greater risk. Implementers must be transparent about the type and purpose of the data they are collecting, as well as its explicit use.<sup>30</sup> Country policy makers must also plan national security agendas that allow for the secure exchange of health data. At a national level, digital SBC interventions must comply with local country standards for data handling, sharing, and interoperability.<sup>31</sup>

## REFERENCES

1. USAID. (2020). A vision for action in digital health. Retrieved from: <https://www.usaid.gov/digital-health-vision>.
2. USAID. (2022). Social and behavior change and health system strengthening. Retrieved from: <https://www.usaid.gov/global-health/health-systems-innovation/health-systems/resources/social-behavior-change>.
3. USAID. (2021). USAID vision for health system strengthening 2030. Retrieved from: [https://www.usaid.gov/sites/default/files/documents/USAID\\_OHS\\_VISION\\_Report\\_FINAL\\_single\\_5082.pdf](https://www.usaid.gov/sites/default/files/documents/USAID_OHS_VISION_Report_FINAL_single_5082.pdf).
4. Michie, S. et al. (2017). Developing and evaluating digital interventions to promote behavior change in health and health care: Recommendations resulting from an international workshop. *J Med Internet Res*, 19(6), e232. Retrieved from: <https://www.jmir.org/2017/6/e232/>.
5. Santarossa, S. et al. (2018). Exploring the role of in-person components for online health behavior change interventions: Can a digital person-to-person component suffice? *J Med Internet Res*, 20(4), e144. Retrieved from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5917076/>.
6. Santarossa, S. et al. (2018). Exploring the role of in-person components for online health behavior change interventions: Can a digital person-to-person component suffice?
7. Michie, S. et al. (2017). Developing and evaluating digital interventions to promote behavior change in health and health care: Recommendations resulting from an international workshop.
8. Hekler, E. et al. (2016). Advancing models and theories for digital behavior change interventions. *Am J Prev Med*, 51(5), 825-832. Retrieved from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5506832/>.
9. Raftree, L. (2019). Digital and social media for behavior change. iMedia Associates. Retrieved from: <https://imediaassociates.org/app/uploads/2019/07/Digital-and-Social-Media-for-SBCC-March-2019.pdf>.
10. Yasmin, F. et al. (2020). The influence of mobile-phone based health reminders on patient adherence to medications and healthy lifestyle recommendations for effective management of diabetes type 2: A randomized control trial in Dhaka, Bangladesh. *BMC Health Serv Res*, 20(1): 520. Retrieved from: <https://pubmed.ncbi.nlm.nih.gov/32513164/>.
11. Michie, S. et al. (2017). Developing and evaluating digital interventions to promote behavior change in health and health care: Recommendations resulting from an international workshop.
12. Michie, S. et al. (2017). Developing and evaluating digital interventions to promote behavior change in health and health care: Recommendations resulting from an international workshop.
13. Raftree, L. (2019). Digital and social media for behavior change.
14. Michie, S. et al. (2017). Developing and evaluating digital interventions to promote behavior change in health and health care: Recommendations resulting from an international workshop.
15. Michie, S. et al. (2017). Developing and evaluating digital interventions to promote behavior change in health and health care: Recommendations resulting from an international workshop.
16. Huckvale, K. et al. (2019). Toward clinical digital phenotyping: A timely opportunity to consider purpose, quality, and safety. *Digital Medicine*, 2(88). Retrieved from: <https://www.nature.com/articles/s41746-019-0166-1.pdf>.
17. Huckvale, K. et al. (2019). Toward clinical digital phenotyping: A timely opportunity to consider purpose, quality, and safety.
18. Population Council. (2020). Informing social and behavior change programs: Using social listening and social monitoring. Retrieved from: [https://knowledgecommons.popcouncil.org/cgi/viewcontent.cgi?article=2294&context=departments\\_sbsr\\_pgx](https://knowledgecommons.popcouncil.org/cgi/viewcontent.cgi?article=2294&context=departments_sbsr_pgx).
19. USAID. (2020). A vision for action in digital health.
20. Population Council. (2020). Informing social and behavior change programs: Using social listening and social monitoring.
21. Mangone, Emily, Pam Riley, and Kenya Datari. (2021). *Digital Financial Services for Health: A Global Evidence Review*. Rockville, MD: USAID Local Health System Sustainability Project, Abt Associates Inc. Retrieved from: [Digital Financial Services for Health: A Global Evidence Review | Local Health System Sustainability Project \(lhssproject.org\)](https://www.lhssproject.org/Digital-Financial-Services-for-Health-A-Global-Evidence-Review).
22. Seo, M. (2019). Can a mobile health payment platform reshape Kenya's health care system? Kaiser Permanente International. Retrieved from: [https://international.kaiserpermanente.org/wp-content/uploads/2019/08/Carepay-MTiba\\_final\\_080519.pdf](https://international.kaiserpermanente.org/wp-content/uploads/2019/08/Carepay-MTiba_final_080519.pdf).
23. Raftree, L. (2019). Digital and social media for behavior change.
24. Santarossa, S. et al. (2018). Exploring the role of in-person components for online health behavior change interventions: Can a digital person-to-person component suffice?
25. Population Council. (2020). Informing social and behavior change programs: Using social listening and social monitoring.



26. Short, C.E. et al. (2018). Measuring engagement in eHealth and mHealth behavior change interventions: Viewpoint of methodologies. *J Med Internet Research*, 20(11), e292. Retrieved from: <https://www.jmir.org/2018/11/e292/>.
27. Cole-Lewis, H. et al. (2019). Understanding health behavior technology engagement: Pathway to measuring digital behavior change interventions. *JMIR Form Res*, 3(4), e14502. Retrieved from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6813486/>.
28. Raftree, L. (2019). Digital and social media for behavior change.
29. USAID. (2020). Considerations for using data responsibly at USAID. Retrieved from: <https://www.usaid.gov/sites/default/files/documents/15396/USAID-UsingDataResponsibly.pdf>.
30. Michie, S. et al. (2017). Developing and evaluating digital interventions to promote behavior change in health and health care: Recommendations resulting from an international workshop.
31. Michie, S. et al. (2017). Developing and evaluating digital interventions to promote behavior change in health and health care: Recommendations resulting from an international workshop.

## FURTHER READING

1. Naimoli, J.F. (2014). The centrality of behavior change in health system development. *Glob Health Sci Pract*, 2(1), 132-133. Retrieved from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4168612/>.
2. Family Planning High Impact Practices. (2020). Digital health to support family planning providers: Improving knowledge, capacity, and service quality. Retrieved from: [https://www.fphighimpactpractices.org/wp-content/uploads/2020/04/DigitalHealth\\_HIP-Brief.pdf](https://www.fphighimpactpractices.org/wp-content/uploads/2020/04/DigitalHealth_HIP-Brief.pdf).
3. Bradford, T.W. et al. (2017). Weight loss through virtual support communities: a role for identity-based motivation in public commitment. *J Interact Mark*, 40, 9-23. Retrieved from: <https://www.sciencedirect.com/science/article/abs/pii/S1094996817300361>.
4. Myneni, S. et al. In pursuit of theoretical ground in behavior change support systems: Analysis of peer-to-peer communication in a health-related online community. *J Med Internet Research*, 18(2), e28. Retrieved from: <https://www.jmir.org/2016/2/e28>.
5. Graham, Y.N.H. et al. Ascertaining the place of social media and technology for bariatric patient support: What do allied health practitioners think? *Obes Surg*, 27, 1691-1696. Retrieved from: <https://link.springer.com/article/10.1007/s11695-016-2527-z>.
6. PATH, USAID. (2018). From online to offline: Taking a 21<sup>st</sup> century approach to HIV prevention and control. Retrieved from: [https://path.azureedge.net/media/documents/From\\_Online\\_To\\_Offline.pdf](https://path.azureedge.net/media/documents/From_Online_To_Offline.pdf).
7. Ng, N. et al. (2021). Sustainable behavior change for health supported by person-tailored, adaptive, risk-aware digital coaching in a social context: Study protocol for the STAR-C Research Program. *Frontier Public Health*, 9(593453). Retrieved from: <https://www.frontiersin.org/articles/10.3389/fpubh.2021.593453/full>.
8. Lindgren, H. et al. (2020). The STAR-C intelligent coach: A cross-disciplinary design process of a behavior change intervention in primary care. *Stud Health Technol Inform*, 273, 203-208. Retrieved from: <https://pubmed.ncbi.nlm.nih.gov/33087613/>.
9. Yavinsky, R., et al. (2021). Can social listening and social media monitoring benefit your SBC activities? *Knowledge Success*. Retrieved from: <https://knowledgesuccess.org/2021/01/04/can-social-listening-and-social-media-monitoring-benefit-your-sbc-activities/>.
10. Local Health System Sustainability Project, USAID. (2021). Year 1: Annual Report. Retrieved from: [https://pdf.usaid.gov/pdf\\_docs/PA00XDJB.pdf](https://pdf.usaid.gov/pdf_docs/PA00XDJB.pdf).
11. Mangone, E. et al. (2021). Digital financial services for health: A global evidence review. USAID, Abt Associates Inc. Retrieved from: [https://www.abtassociates.com/files/insights/resources/2021/lhss\\_core-activity-5\\_dfs-for-health-report\\_final.pdf](https://www.abtassociates.com/files/insights/resources/2021/lhss_core-activity-5_dfs-for-health-report_final.pdf).
12. Kepper, M. et al. (2021). Development of a health information tech tool for behavior change to address obesity and prevent chronic disease among adolescents: Designing for dissemination and sustainment. *Front. Dig Health*, 3(648777). Retrieved from: <https://www.frontiersin.org/articles/10.3389/fdgh.2021.648777/full>.
13. Thomas, J.G. et al. (2015). Behavioral response to a just-in-time adaptive intervention (JITAI) to reduce sedentary behavior in obese adults: Implications for JITAI optimization. *Health Psychol*, 34(0), 1261-1267. Retrieved from: <https://pubmed.ncbi.nlm.nih.gov/26651467/>.

14. Breakthrough Research. (2021). *Understanding the costs of SBC social media interventions*. Retrieved from: [http://breakthroughactionandresearch.org/wp-content/uploads/2021/08/BR\\_COP\\_SocialListening\\_Brief.pdf](http://breakthroughactionandresearch.org/wp-content/uploads/2021/08/BR_COP_SocialListening_Brief.pdf).
15. High Impact Practice. (2018). Digital health for social and behavior change: New technologies, new ways to reach people. Retrieved from: <https://fphighimpactpractices.org/briefs/digital-health-sbc/>.
16. Craig, K.J.T. et al. *Systematic review of context-aware digital behavior change interventions to improve health*. Available at: <https://academic.oup.com/tbm/article/11/5/1037/5934751?login=true>.
17. Mussener, Ulrika et al. *Digital encounters: Human interactions in mHealth behavior change interventions*. Available at: <https://journals.sagepub.com/doi/full/10.1177/20552076211029776>.
18. Patrick, Kevin et al. (2020). The pace of technological change: Implications for digital health behavior intervention research. *Translational Behavioral Medicine*, 11(5), 1037-1048. Retrieved from: [https://www.ajpmonline.org/article/s0749-3797\(16\)30138-6/fulltext](https://www.ajpmonline.org/article/s0749-3797(16)30138-6/fulltext).
19. McNamee, P. et al. (2016). Designing and undertaking a health economics study of digital health interventions. *Am J Prev Med*, 51(5), 852-860. Retrieved from: <https://pubmed.ncbi.nlm.nih.gov/27745685/>.
20. Murray, E. et al. (2016). Evaluating digital health interventions: Key questions and approaches. *Am J Prev Med*, 51(5), 843-851. Retrieved from: <https://pubmed.ncbi.nlm.nih.gov/27745684/>.
21. Yardley, L. et al. (2016). Understanding and promoting effective engagement with digital behavior change interventions. *Am J Prev Med*, 51(5), 833-842. Retrieved from: <https://pubmed.ncbi.nlm.nih.gov/27745683/>.
22. Gruver, R.S. et al. (2016). A social media peer group intervention for mothers to prevent obesity and promote healthy growth from infancy: Development and pilot trial. *JMIR Res Protoc*, 5(3), e159. Retrieved from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4987492/>.
23. Spark-Depass, E. et al. (2021). Better treatment, better care: The promise of digital adherence technologies. *PATH*. Retrieved from: <https://www.path.org/articles/better-treatment-better-care-promise-digital-adherence-technologies/>.
24. Islam et al. (2015). Effects of mobile phone SMS to improve glycemic control among patients with type 2 diabetes in Bangladesh: A prospective, parallel-group, randomized control trial. *Diabetes Care*, 38(8), e112-e113. Retrieved from: <https://diabetesjournals.org/care/article/38/8/e112/31586/Effects-of-Mobile-Phone-SMS-to-Improve-Glycemic>.
25. Naoum, P., et al. (2021). Economic evaluation of digital health interventions in palliative care: A systematic review of the literature. *Front Dig Health*, 3(730755). Retrieved from: <https://www.frontiersin.org/articles/10.3389/fdgh.2021.730755/full>.



### About the Health Systems Strengthening Practice Spotlight Series

The Health Systems Strengthening Practice Spotlight series is an initiative of USAID's Office of Health Systems. Practice Spotlight briefs contribute to the global knowledge base in health system strengthening and support implementation of USAID's Vision for Health System Strengthening 2030 and the accompanying Health System Strengthening Learning Agenda. Learn more:

[Vision for Health System Strengthening 2030 | U.S. Agency for International Development \(usaid.gov\)](https://www.usaid.gov/vision-for-health-system-strengthening-2030)

[Health System Strengthening Learning Agenda | U.S. Agency for International Development \(usaid.gov\)](https://www.usaid.gov/learning-agenda)

### Acknowledgements

This brief was written by Celina Kareiva of PATH and Rachel Marcus of USAID. We are grateful to the following for their technical input and review: Sherri Haas, Neetu Hariharan, Kama Garrison, and Kelly Thomas of USAID; Anne Bulchis, Anna Volbrecht-Shaw, Eden Tarimo, and Oswald Luoga of PATH; and Lynne Cogswell of the Manoff Group.

### Recommended citation

Health Systems Strengthening Practice Spotlight. March 2022. *Digital Social and Behavior Change in HSS: Strengthening Health Systems Through Social and Behavior Change Interventions That Use Digital Technologies*. Washington, DC: USAID. Available at: [www.LHSSproject.org](http://www.LHSSproject.org) and <https://www.usaid.gov/global-health/health-systems-innovation/health-systems/resources/practice-spotlight-series>.

The Health Systems Strengthening Practice Spotlight briefs are made possible by the support of the American people through the United States Agency for International Development (USAID). The contents are the sole responsibility of the authors and do not necessarily reflect the views of USAID or the United States government.

March 2022