K4D | Knowledge, evidence and learning for development

Digital approaches to managing staff absenteeism

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Question

Produce a report looking at experience and emerging practice in the use of digital approaches to manage/monitor staff absenteeism, in particular health staff.

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1. Overview

Examples of digital approaches to monitoring staff absenteeism were difficult to find in the literature within the scope of this review. There was a sense from experts consulted that monitoring attendance may well be going on alongside other mhealth and ehealth interventions.

Research looking at the use of smartphones to monitor doctor attendance in Pakistan found many other factors affecting attendance other than the monitoring (Callen et al 2013). Health systems inspectors uploaded results to an aggregating website. Smartphone monitoring doubled inspection rates and relatively few phones were used to cover a large population. Because politicians provide public jobs, doctors were found to be considerably more likely to be present at work in competitive constituencies.

A system in India which electronically transmits time and date stamps to monitor nurse absence found that incentives were required alongside the monitoring for effective change (Banerjee et al 2008). There were problems with staff being excused for meetings which could not be proven (Abdul Latif Jameel Poverty Action Lab, 2009). Machines were also found to be deliberately broken.

One example from the field of education is widely cited in the literature. An experiment was conducted in a remote rural area in India where regular monitoring is difficult. Children were instructed to take photos of teachers with cameras (Duflo & Hanna, 2005). The cameras had tamperproof date and time functions. The program was found to be effective compared to a control with 22 percent absence in treatment schools and 42 percent absence in comparison schools. Test scores were also higher in the treatments schools.

An article on digital crowdsourcing in the agricultural sector is included in section 3 (Rezaee et al, 2015). It is not an example of monitoring for absenteeism but shows the potential of digital approaches to crowdsource information. Crowdsourcing can be used to monitor absenteeism (Deussom et al., 2012).

Labrique et al (2013) emphasises that mhealth solutions should have multiple functions. Mobiles for Quality Improvement in Uganda is an example of technology use for health management which could be used as a platform for also monitoring absenteeism. Process and software tools were established to improve provider performance improving adherence to clinical protocols (Riley & BonTempo, 2011). User feedback platforms could also be used for monitoring absence (see MeTA 2014 as an example of a feedback platform).

Research on teacher absence (without the use of technology) does caution that the presence of teachers does not necessarily mean teachers are working (Chaudhury et al 2006). Digital solutions should measure performance also.

2. Key papers

The Political Economy of Public Employee Absence: Experimental Evidence from Pakistan
Callen M, Gulzarz S, Hasanain A & Khan Y. (2013). University of California, San Diego.
https://www.povertyactionlab.org/sites/default/files/publications/909%20Political%20Economy%20of%20Public%20Employee%20Absence%20in%20Pakistan%20Feb2014.pdf

In many developing countries, public sector absence is both common and resistant to reform. One explanation for this is that politicians provide public jobs with limited work requirements as patronage. The authors test this patronage hypothesis in Pakistan using: (i) a randomised controlled evaluation of a novel smartphone absence monitoring technology; (ii) data on election outcomes in the 240 constituencies where the experiment took place; (iii) attendance recorded during unannounced visits and; (iv) surveys of connections between local politicians and health staff. Four results support this view. First, while doctors are present at 42 percent of clinics in competitive constituencies, they are present at only 13 percent of clinics in uncompetitive constituencies. Second, doctors who know their local parliamentarian personally are present at an average of 0.727 of three unannounced visits, while doctors without this connection are present at 1.309 of the three visits. Third, around 40 percent of inspectors and health administrators report interference by politicians when they try to sanction doctors. Fourth, the effect of the smartphone monitoring technology, which almost doubled inspection rates, is highly localised to competitive constituencies. Last, evidence of program impact is found in part due to the transmission of information to senior officers. This is tested by manipulating the salience of staff absence in data presented to officials using an online dashboard. These effects are also largest in politically competitive constituencies. These results have implications for the study of bureaucratic incentives in fragile states and are potentially actionable for policymakers trying to build state capacity.

Details of the digital technology:

The smartphone monitoring system required only 90 smart phones to implement and more than doubled health inspections in half of the Punjab Province (with a population the size of Germany). The smartphone-based solution implemented allows health system inspectors to upload the results of their assigned visit to a basic health facility to an aggregating website (dashboard), which instantly updates reports at different levels of aggregation (zonal and provincial) with the information captured by this most recent visit. The "Monitoring the Monitors" program replaced the traditional paper-based monitoring system, which collects data on facility utilisation, resource availability, and worker absence, with an android-based smartphone application. Data are transmitted to a central database using a General Packet Radio Service (GPRS) in real time. Data are then aggregated and summary statistics, charts, and graphs are presented in a format designed in collaboration with senior health officials. That data are: (i) aggregated in the province in real time; (ii) geo-tagged, time-stamped, and complemented with facility staff photos to check for reliability; and (iii) available in real time to district and provincial officers through an online dashboard. Application development started in August 2011. After developing the application and linking it to a beta version of the online dashboard, the system was piloted in the district of Khanewal.

Putting a Band-Aid on a Corpse: Incentives for Nurses in the Indian Public Health Care System Banerjee A, Duflo E, and Glennerster R. (2008). Banerjee, A. V., Duflo, E., & Glennerster, R. (2008). Journal of the European Economic Association, 6(2-3), 487-500.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2826809/

This paper reports the results of a randomised evaluation of a program implemented collaboratively by Seva Mandir, a leading NGO, and the health administration of the State of Rajasthan and of the district of Udaipur, to improve the attendance of nurses in sub-centres and aid-posts. Under the program, Seva Mandir manages a system for monitoring nurses using time and date stamps, and transmits the information to the government, which is then supposed to use the information to provide incentives to nurses (a specific scheduled of fines and punishment was introduced). The first result of this evaluation was that as long the incentives were effectively in place (as in the first 6 months of the program), they lead to a dramatic improvement in attendance (a doubling by some measures). However, after the first six months the health administration deliberately undermined the incentive system, with the result that 16 months after the start of the program, there was no difference between the presence rate in treatment and comparison centres—both were extremely low (below 40%). These results show that, just like informal school teachers, nurses are responsive to properly-administered incentives. They also show that making the nurses come to work is not a priority for the local health administration and that incentive systems get undermined quickly if there is no sufficient political will to enforce them. This suggests that pouring more money into the system as it stands, which is what is currently planned, will not solve the underlying problem.

Showing Up is the First Step. Addressing Provider Absence in Education and Health
Abdul Latif Jameel Poverty Action Lab (2009) MIT
https://www.povertyactionlab.org/sites/default/files/publications/Showing%20Up%20is%20the%20First%20Step.pdf

Seva Mandir installed date and time-stamping machines in clinics in Udaipur, India to monitor nurses and help local government officials implement incentives for nurses' attendance. Absent nurses would be paid less and could be fired. However, absences for legitimate reasons such as meetings could be "excused" by supervisors. Research finds that, for the first few months, the program increased attendance. However, the program's effectiveness quickly degenerated. Nurses deliberately broke several machines. Moreover, supervisors substantially increased the number of absences they excused—even on days when no meetings were held and no legitimate excuses were available. By failing to abide by the machine's monitoring, supervisors undercut the program. The effect of the program dissipated; nurses in the incentive group were soon absent as frequently as those in the comparison group.

Monitoring works: getting teachers to come to school

Duflo E & Hanna R. (2005). NBER Working Paper No.11880.
http://www.nber.org/papers/w11880.pdf

In the rural areas of developing countries, teacher absence is a widespread problem. It has been argued that teachers fail to attend school because neither their principal nor the beneficiary has the capacity to both effectively monitor and penalise absence. The principals, usually governments (but also NGOs), have the power to penalise absences, but, being far removed, may not be able to effectively monitor attendance. As such, they often lack the information needed to enforce attendance rules. The community can effectively monitor attendance, but it often lacks the power to penalise absence. One solution—championed by many, including the 2004 World Development Report— is to expand community control by improving community-based monitoring; strengthening the flow of information between the community and the principal; involving the community in decisions to hire, fire, and pay teachers; or transferring wholesome control of teachers to the community. However, evidence from a variety of contexts suggests that community control interventions have not been particularly effective at reducing absence. There is limited evidence that external control, coupled with a clear and credible threat of punishment, may be more effective at inducing "good" behaviour.

This paper tests whether a simple incentive program based on teacher presence can reduce teacher absence, and whether it has the potential to lead to more teaching activities and better learning. In 60 informal one-teacher schools in rural India, randomly chosen out of 120 (the treatment schools), a financial incentive program was initiated to reduce absenteeism. The location, Udaipur, is a sparsely populated, hilly region where villages are often remote and hard to reach, making regular monitoring of the NFEs difficult. Teachers were given a camera with a tamperproof date and time function, along with instructions to have one of the children photograph the teacher and other students at the beginning and end of the school day. The time and date stamps on the photographs were used to track teacher attendance. A teacher's salary was a direct function of his attendance. The remaining 60 schools served as comparison schools.

The introduction of the program resulted in an immediate decline in teacher absence. The absence rate (measured using unannounced visits both in treatment and comparison schools) changed from an average of 42 percent in the comparison schools to 22 percent in the treatment schools. That absence rates stayed low after the end of the (proper) evaluation phase implies that the effect was not due to a Hawthorne Effect—namely, teachers did not change their behaviour simply for the experiment. When the schools were open, teachers were as likely to be

teaching in both types of schools, and the number of students present was roughly the same. The program positively affected child achievement levels: a year after the start of the program, test scores in program schools were 0.17 standard deviations higher than in the comparison schools and children were 40 percent more likely to be admitted into regular schools.

The findings suggest that external monitoring coupled with simple, direct incentives may also be used to reduce absence among providers of other services essential to development, such as health, in rural areas where the need is the greatest and absence is most prevalent.

This paper is on the same experiment. It is published more recently but offers no new conclusions:

Incentives work: Getting teachers to come to school
Duflo E, Hanna R, & Rya SP. (2012). The American Economic Review, 102(4), 1241-1278. http://economics.mit.edu/files/5582

3. Further references

Holding Health Workers Accountable: Governance Approaches to Reducing Absenteeism
Deussom R, Jaskiewicz W, Dwyer S and Tulenko K. (2012). Capacity*Plus*.
http://www.intrahealth.org/files/media/holding-health-workers-accountable-governance-approaches-to-reducing-absenteeism/holding-health-workers-accountable-governance-approaches-reducing-absenteeism.pdf

Health workers or communities can use mobile phones with SMS texting capabilities to encourage reporting the presence or absence of health workers, in addition to facility standards, patient waiting times, availability of medicines, and other quality or productivity indicators. Such crowdsourcing applications have the potential to provide managers and health workers with quantitative and qualitative information to develop action plans to address productivity (and/or quality) issues, such as absenteeism. Crowdsourcing can also empower communities to engage with the health system and hold it accountable to meet minimum quality and access standards for service delivery. Anonymous mobile-phone surveys, toll-free phone lines, or e-mail addresses provide outlets of communication for health workers to describe their work environment and housing conditions, make anonymous reports of absent colleagues or cases of harassment, or bring attention to other related components of their work climate. This can be effective, assuming that managers respond in a timely and confidential manner.

Crowdsourcing government accountability: Experimental evidence from Pakistan
Rezaee A, Hasanain A, & Khan Y. (2015). International Growth Centre, Working Paper S-37307-PAK-1. http://www.theigc.org/wp-content/uploads/2016/01/Hasanain-et-al-2015-Working-paper-1.pdf

The researchers designed and implemented an information clearinghouse to reduce government agent shirking in a context fraught with asymmetric information: agricultural service provision in the developing world. The clearinghouse provides citizens in rural Punjab, Pakistan with government veterinarians' success rates at artificially inseminating livestock, an objective measure of veterinarian effort. It gathers and disseminates locally relevant information from a large 2 base of farmers automatically, in real time, using a call centre. The clearinghouse model stands in contrast to government monitoring schemes that provide information to agents' superiors, relying on the "long route" of accountability in which citizens must influence policymakers to improve service provision. It approaches the problem more directly; it

strengthens the "short route" of accountability by increasing citizens' direct power over government agents.

mHealth innovations as health system strengthening tools: 12 common applications and a visual framework
Labrique AB, Vasudevan L, Kochi E, Fabricant R, & Mehl G. (2013). Global Health: Science and Practice, 1(2), 160-171.
http://www.ghspjournal.org/content/1/2/160.full.pdf

Rather than being perceived as siloed, standalone solutions, mHealth strategies should be viewed as integrable systems that should fit into existing health system functions and complement the health system goals of: health service provision; a well-performing health workforce; a functioning health information system; cost-effective use of medical products, vaccines, and technologies; and accountability and governance.

Mobiles for Quality Improvement Pilot in Uganda
Riley P and BonTempo J. (2011) Bethesda, MD: Strengthening Health Outcomes through the Private Sector Project, Abt Associates Inc.
http://www.shopsproject.org/sites/default/files/resources/SHOPS%20m4QI%20Uganda%20Pilot%20Report.pdf

The objectives of Mobiles for Quality Improvement (m4QI) were to develop and test a technology-supported approach to performance improvement including processes for identifying performance gaps in adherence to clinical protocols, a platform to manage and automate the delivery and receipt of text message reminders and quizzes to address the gaps, and production of actionable data to improve effectiveness of supportive supervision and follow-up. To support scalability and replicability, the pilot platform was designed for users of low-end phones, and those without Internet access.

A pilot was carried out in Uganda. The process and software tool for improving provider performance was established. Messages were successfully sent and received although technical issues resulted in intermittent periods of non-delivery. Participants reported changes in knowledge, practice, and motivation. There was also increased team interaction on issues related to quality of service.

Governing through the phone: How policymakers can leverage ICT to improve governance outcomes
Hasanain A. (2016) Global Economic Governance Programme
http://globaleconomicgovernance.org/sites/geg/files/GEG%20Hasanain%20July%202016.pdf

Drawing on examples from countries around the world, this policy brief provides illustrations of the ways that ICT interventions can improve governance such as:
1) Improving monitoring of staff performance and auditing of service delivery by governments departments, and in election monitoring for institution-building
2) Disseminating information to citizens, for example about emergency services during disaster-relief work and on agricultural extension services to farmers, and disseminating technical knowledge and training to government officials through online courses.

The Punjab province of Pakistan is home to more than 100 million people, spread over an area approximately equal to England and Ireland combined. Staff for various government departments are located in dispersed locations across the province, with relatively little oversight of local

officials by senior bureaucrats in the provincial capital. In 2011, the provincial health department collaborated with researchers to pilot a smartphone-based system that replaced the paper-based monitoring of facilities with data entry using smartphones. This system instantly transmitted the data it gathered to a website that updated detailed statistics and graphs using that data. This information became available to senior government officials, who were able to use it to provide feedback to local staff. As a result, staff performance on certain metrics doubled in many areas.

The low resolution screen shot below extracted from this brief shows a graph of the percentage of facilities where the medical officer was not available during a random visit as an example.

Figure 1: Punjab Health Department Data Aggregation Website
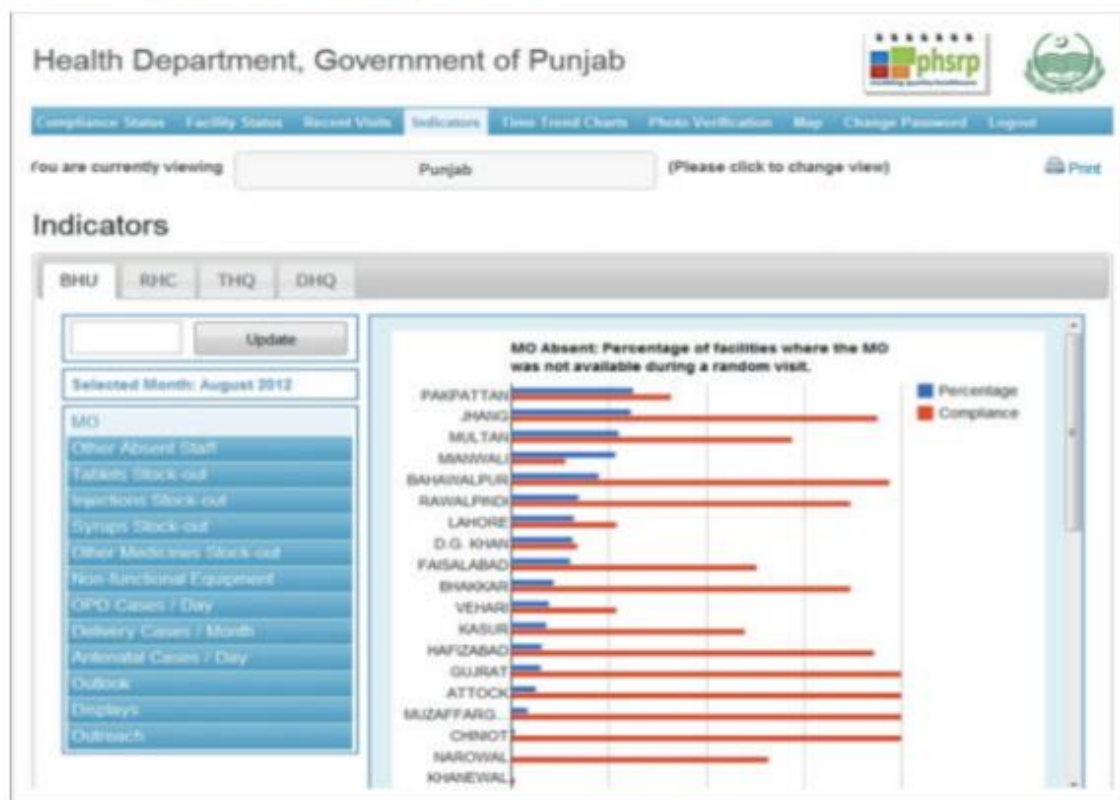
The brief notes the importance of ensuring the veracity of data. The presentation of the data can affect interpretation. ICT interventions can go wrong when context is ignored and there is a lack of underlying demand for reform.

A famous early example of an ICT-based reform effort that failed was a nurse attendance monitoring system set up in Udaipur in Rajasthan, India (see Banerjee et al., 2008, section 2). A lack of senior bureaucrats' desire for reform meant that a technical solution could not survive for long. Similarly, the case of health official monitoring in Punjab, Pakistan, described how an ICT-based intervention yielded a doubling of certain metrics. The caveat however, is that this impact was localised to constituencies with competitive politics, and yielded no impact elsewhere. Both of these cases can be interpreted to make a more general and simple conclusion: technology-based reforms can be very powerful, but only if there is an underlying human demand for change.

Client Satisfaction with Services in UGANDA's Public Health Facilities. A Study by the Medicines Transparency Alliance (MeTA), Uganda
MeTA (2014) UNHCO
http://apps.who.int/medicinedocs/documents/s21905en/s21905en.pdf

Health service clients were polled via U-Report, a new mobile phone-based technology developed by UNICEF Uganda. Through a series of short questions sent by SMS, U-report enables citizens to provide real-time feedback from across Uganda, allowing for improved governance, accountability and transparency in health centers. Some respondents reported on staff absence.

Digital technology for health sector governance in low and middle income countries: a scoping review
Holeman I, Cookson TP, & Pagliari C. (2016). Journal of Global Health, 6(2).
http://www.jogh.org/documents/issue201602/jogh-06-020408.pdf

This paper refers to monitoring staff absence as one of the purposes of digital technology in health. The paper notes that automation and auditing may help to address inappropriate practices by taking processes or decisions out of the hands of individual health care personnel and intermediaries. For example, new algorithms can automatically detect "outlier" data sets that show signs of having been faked by an absentee worker rather than having emerged from a genuine patient encounter.

Missing in Action: Teacher and Health Worker Absence in Developing Countries
Chaudhury N, Hammer J, Kremer M, Muralidharan K and Halsey Rogers F. (2006) Journal of Economic Perspectives, 20 (1).
http://siteresources.worldbank.org/INTPUBSERV/Resources/477250-1187034401048/ChaudhuryandothersMIA.pdf

This paper reports results from a survey in which enumerators made unannounced visits to primary schools and health clinics in Bangladesh, Ecuador, India, Indonesia, Peru and Uganda and recorded whether they found teachers and health workers in the facilities. The investigators recorded absence as well as whether workers present were actually working. Around one-half of teachers who were present at work were found not to be working.

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About this report

This report is based on five days of desk-based research. The K4D research helpdesk provides rapid syntheses of a selection of recent relevant literature and international expert thinking in response to specific questions relating to international development. For any enquiries, contact helpdesk@k4d.info.

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