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Can information improve rural governance and service delivery?

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ABSTRACT

In the context of an exponential rise in access to information in the last two decades, this special issue explores when and how information might be harnessed to improve governance and public service delivery in rural areas. Information is a critical component of government and citizens' decision-making; therefore, improvements in its availability and reliability stand to benefit many dimensions of governance, including service delivery. Service delivery is especially difficult in rural areas which contain the majority of the world's poor but face unique logistical challenges due to their remoteness. We review the features of the recent information revolution, including increased access to information due to both technological and institutional innovations. We then raise the question of why information often fails to support the goals of improved governance and service delivery. We argue that information alone is insufficient. To be impactful, the information must be deemed relevant, in the sense of being salient and having a high perceived signal-to-noise ratio, and individuals must have both the power and incentives to act on it. Bringing all three of these factors together in any setting is challenging, particularly for rural areas, where capacity to receive, understand, and act on information is relatively low. Research failing to find significant effects of greater access to information on rural governance and service delivery has largely failed due to one of these three factors not being in place. This interpretation is broadly supported by our review of 48 empirical studies on the impacts of information on governance and service delivery. We conclude by discussing broader lessons for both development research, including randomized control trials, and the development process itself. The goals of interventions to provide information may need to be more modest, and their design may merit more scrutiny.

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1. Introduction

Perhaps one of the most novel and transformative features in the field of economic development in the last two decades has been the exponential increase in access to information. For researchers, the age of field research and “big data” has changed both the types of questions they can ask as well as the methods employed and the rigor of analyses (Einav & Levin, 2014). Data are available with greater coverage, frequency, and reliability than ever before, and transferring and processing them has become increasingly cheaper and easier. But perhaps even more transformatively, greater access to information has also been proposed as a route to realize economic prosperity and good governance. Just as improving the information sets of producers and consumers leads to welfare improvements for both by encouraging market integration and reducing price dispersion and misallocation (Jensen, 2007; Aker & Mbiti, 2010), information in the political

sphere can serve as a coordinating device for voters and improve electoral accountability (Ferejohn & Kuklinski, 1990; Fey, 1997; Fujiwara & Wantchekon, 2013; Keefer & Khemani, 2005). This has the potential for far-reaching impacts on governance and institutions. For example, social media is widely credited with helping to topple dictators during the Arab Spring, starting in 2011 (Howard et al., 2011). As U.S. Supreme Court Justice Louis Brandeis once famously observed, “sunshine is the best disinfectant.”

One area in which information could in theory significantly improve development outcomes is in rural public service delivery and governance. About 68 percent of the world's poor live in rural areas worldwide, making a focus on rural areas critical (World Bank, 2017). Rural services include agricultural services (including those related to extension and water access), infrastructure (including roads, clinics, and schools), and social services (such as healthcare, education, and social protection), among others. Such investments have the potential to significantly improve individual productivity, incomes, and citizens' welfare. This is both because government investments in physical and human capital support individuals' livelihoods directly (e.g., agricultural extension

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services train farmers to make better investments, and public healthcare reduces the overall incidence of illness and thus directly makes workers more productive) and because they raise individuals' goals and aspirations for the future—thus convincing them to make costly but rewarding investments of their own (Kosec & Mo, 2017; Kosec & Khan, 2016). In addition to service delivery, government also has the important role of supporting economic activity through good economic governance. This entails upholding formal and informal institutions that protect property rights and enforce contracts (Dixit, 2008). Governments in developing countries often fail in these roles, stifling economic activity and fostering distrust in government. Understanding whether and how information encourages good economic governance is thus a critical question.

Rural areas present logistical challenges due to their remoteness that can make government accountability and service delivery especially challenging and tenuous. They are often less politically and economically integrated than the rest of the country, and public services are often delivered in an environment with both poor information among service providers about the demands of service users and poor information among service users about the mandates and capabilities of service providers. In such an environment, policymakers may use information asymmetries to their advantage, to the detriment of rural citizens' welfare (Olken, Banerjee, Hanna, & Kyle, 2018). This is especially likely when overall levels of education and political engagement of the citizenry are relatively low—common features of rural settings. Despite these heightened challenges, unskilled workers typically have a much higher valuation of government services than do more skilled workers (Serrato & Wingender, 2014). This is especially so for the case of government services which have private substitutes disproportionately consumed by richer and more skilled citizens, such as in the education and health sectors (Kosec, 2014). Many types of public spending, such as cash transfers, also explicitly target only poor citizens. Understanding how information might help improve service delivery in rural areas is thus a critical question for poverty reduction and economic development.

In theory, greater access to information can counteract government failures and improve rural service delivery and governance. Providing information to governments may help overcome information asymmetries between service users and service providers, which often result in inefficient or misdirected expenditures even when government is well-intentioned. Or it may help the central government induce effort from lower-level policymakers (Hayek, 1945; Kosec & Mogue, 2017). Providing information to citizens may enable them to better monitor and thus reward or sanction service providers, incentivizing high-quality public investments. Indeed, the premise that individuals will “vote with their feet” in response to bad economic policies assumes that they have information on how policies in other jurisdictions compare to those in their own (Tiebout, 1956). And when voters can gather information on local policymakers' performance by measuring outcomes against those in similar jurisdictions, this can induce “yardstick competition” and thus motivate high-quality public investments (Besley & Case, 1995; Seabright, 1996). When citizens have information they can also better articulate their policy priorities and provide electoral support for good governance more broadly (Wantchekon, López-Moctezuma, Fujiwara, & Lero, 2015; Wantchekon, 2017). High-quality information can also provide a foundation for improved economic governance, such as by allowing governments to issue land titles or impartially adjudicate a property rights dispute.

Despite strong potential, in theory, for information to improve public service delivery and economic development, the burgeoning evidence on its impacts is mixed, at best. Several studies show positive effects; for example, information can help the central govern-

ment benchmark lower-tier government policymakers against one another and thus induce effort (Jia, Kudamatsu, & Seim, 2015). And increasing voter access to the media and information can increase policymaker responsiveness and improve governance (Ahrend, 2002; Banerjee, Kumar, & Pande, 2011; Besley & Burgess, 2002; Brunetti & Weder, 2003; Djankov, McLiesh, Nenova, & Shleifer, 2003; Ferraz & Finan, 2008a; Ferraz & Finan, 2008b; Peisakhin & Pinto, 2010; Reinikka & Svensson, 2004; Reinikka & Svensson, 2005; Strömberg, 2004). However, other studies find no effect of providing information to voters (Humphreys & Weinstein, 2012; Lieberman, Posner, & Tsai, 2014), mixed results (Chong, Ana, & Karlan, 2015), or even perverse negative consequences like dampened voter turnout, lower perceived access to government information and influence on governance, or more clientelism (Banerjee, Banerji, Duflo, Glennerster, & Khemani, 2010; Chong, De La, Karlan, & Wantchekon, 2010; Cruz et al., 2016; Driscoll & Hidalgo, 2014; Jung, Ferree, & Gibson, 2012; Lieberman, Posner, & Tsai, 2014; Protik, Nichols-Barrer, Berman, & Sloan, 2018; Ravallion, van de Walle, Dutta, & Murgai, 2015). Further, informing voters may require costly civic education campaigns (Gottlieb, 2016) which may be infeasible in rural, developing country settings. Efforts to improve citizen engagement through participatory governance have also yielded mixed results (Chaudhury & Parajuli, 2010; Casey, Glennerster, & Miguel, 2012; Duflo, Dupas, & Kremer, 2015; Humphreys, de la Sierra, & Van der Windt, 2012; Olken, 2007).

What accounts for the selective success of information-related interventions aimed at improving rural service delivery and governance? We argue that information alone is insufficient; the information must additionally satisfy three necessary conditions. First, it must be deemed relevant by the individual receiving it, which means it is salient and perceived to contain a high signal-to-noise ratio. Second, individuals must have the power to act on it; their capabilities and mandates must allow them to meaningfully change their behavior in response to the information and shape government policies. Third, they must be incentivized to act on it because it is payoff relevant. We posit that a lack of positive, significant effects of greater access to information on rural service delivery and governance is due to one of these three factors not being in place. In rural, developing country settings, simultaneously bringing together relevance, power, and incentives may be especially challenging due to low capacity to receive, understand, and act on information. However, ironically, the payoffs of doing so in such a setting might well be largest. Drawing on several studies, many part of this special issue, we show how failing any one of the three conditions can result in information not having its anticipated, beneficial effects.

This paper is organized as follows. Section 2 outlines the conceptual framework guiding our discussion of information. It highlights how information is a critical component in government actors' and citizens' decision-making, and thus improvements in the availability and reliability of information can in theory reduce information asymmetries and improve governance. In doing so, it draws on principal agent models and the inherent information asymmetries that characterize rural public service delivery. Section 3 discusses what the new information revolution brings to these models, including how it is in many settings fundamentally changing the degree of information asymmetry characterizing relationships between the state and society. Section 4 raises the question of why information often fails to support the goals of improved governance and service delivery. It then outlines our main hypothesis about the necessary conditions for information to have a positive impact. Section 5 proposes several recommendations for bringing about conditions in which relevant information is available to individuals with both the power and incentives to act on it. Section 6 talks in more detail about the theory of change

surrounding information provision, including whether relevance, power, and incentives can be considered necessary conditions for information to have salutary effects and whether they can be considered sufficient conditions. Finally, Section 7 concludes, discussing implications of these findings for both development research, including randomized control trials, and the development process more broadly.

2. Conceptual framework: information & governance

Information plays a critical role in governance. Politicians carry out important functions including taxation, expenditures, and passing laws and regulations, basing decisions on the information at their disposal and the set of rules and institutions in place. In democratic settings, citizens elect a politician to carry out these (and possibly other) roles, assess the politician's performance based on the information available to them, and either punish (do not reelect) or reward (reelect) the politician and/or her party based on how well they carry out these roles compared to other prospective candidates. It is also important to note that politicians are often both principals and agents (Devarajan & Reinikka, 2004; World Bank, 2004). Citizens hold politicians to account in one principal-agent relationship, but politicians hold frontline service providers accountable in another. Information is important for both principal-agent relationships.

For electoral incentives to work, and motivate politicians to be responsive, citizens must have information on what politicians' mandates are and how well they have performed vis-a-vis those mandates. If citizens lack this information, then they are unlikely to be able to differentiate the politician in office from potential competitors, effectively nullifying electoral competition and accountability. In addition to creating electoral incentives, information may also stimulate citizen demand for services. For example, if citizens know that it is the mandate of government to provide free and high-quality education to all children, they are more likely to ask for it in the ballot boxes, or criticize poor quality education through protests. Thus, information in the hands of citizens is critical to incentivize politician effort and ensure high quality governance and service delivery in democracies.

Even in more autocratic settings without electoral accountability in place, information in the hands of citizens may be critical to incentivize politician effort. For example, encompassing and embedded solidarity groups may push politicians to adhere to unofficial rules and norms, thus creating informal institutions of accountability (Tsai, 2007). And politicians may want to be responsive to citizens' preferences simply to avoid protests and other threats of collective action (Chen, Pan, & Xu, 2016). Since citizen access to information may influence solidarity group formation and collective action, autocratic governments may make different choices when citizens are well-informed as opposed to poorly informed.

Beyond the question of whether citizens have access to information, politician access to information can also matter hugely for service delivery and governance. Even if a politician is accountable and responsive to citizens' preferences, they need to know what those preferences are as well as the most effective policies for achieving desired outcomes. The electoral process itself may help citizens indicate their preferences, but technological innovations (e.g., the ability to send text messages to politicians, or to participate in online dialogues with politicians) or institutional innovations (e.g., increasing the prevalence and inclusiveness of town hall meetings, or undertaking a process of political decentralization in which relatively knowledgeable local officials play a more central role in public investment) may help increase access to information about citizens preferences. The latter may also be

instrumental to ensuring that policymakers know the most efficient and effective ways of bringing about desired outcomes. For example, for the case of a public infrastructure project, knowledge about the best materials, construction firms, project locations, and timelines will contribute to a higher-quality project.

A lack of information can also contribute to within-government principal-agent problems, as Khemani et al., 2016 highlight. These include relationships between political leaders and public officials, and between public officials and frontline providers. Governments usually deliver public services precisely in sectors in which market failures prevail, which means there are relatively few market-based indicators of performance, and information asymmetries can contribute to a lack of accountability. Powerful bureaucrats in charge of implementing government policies may have a variety of motives—such as being biased toward the interests of their clients, or actually being hostile toward them—which have implications for the efficiency and quality of public services (Prendergast, 2007). They may also simply be corrupt or lack motivation. Information, as Khemani et al. (2016) describe, has a strong potential to solve these principal-agent problems. Of course, there remains the concern that bureaucrats might manipulate information flows in their favor and in ways that tend to harm public goods delivery and governance.

There are many ways to provide information. Khemani et al. (2016) define transparency as citizen access to publicly available information about the actions of those in government and the consequences of those actions. Politicians can provide citizens with information about their mandates, how they have allocated their budgets, what they have accomplished, and what their opponents have done in a variety of ways. These might include official reports, stories provided to the media, websites, campaign activities, or outreach mediated by grassroots organizations. Citizens can also share information with politicians and service providers in a multitude of ways, such as through voting, attending government-held meetings, letters and petitions, stories provided to the media, protests, participation in civic organizations, and campaigning. Other actors may also share and spread information; for example, a private sector firm that stands to benefit from a particular policy decision may wish to organize potential allies or defuse potential opponents by disseminating information.

Of course, it is also important to acknowledge that the same piece of information may mean different things to different individuals. This may be due to characteristics of the recipient (e.g., their education level or familiarity with a topic) or the provider (e.g., their perceived credibility or motives). This underscores the importance of considering how information is understood.

Importantly, however, the information provided by politicians, citizens, or other parties is not necessarily received and/or acted upon. Individuals and politicians may fail to hear information at all, may believe information to be false or skewed, or may receive conflicting information from another source. Information adaptation and customization may help increase the perceived relevance, credibility, and reach of information, but can be costly and difficult. Further, individuals may lack the power and ability to act on the information; for example, local politicians may have little power over decisions taken by higher-levels of government, and poor citizens may lack the resources to travel to the capital to protest in front of higher-level politicians. We take this logic forward in Section 4, outlining three conditions which must be satisfied if information is to potentially benefit rural governance and service delivery: relevance to the recipient, recipients with the power to act on it, and recipients with incentives to act on it. In Section 5, we review existing literature which supports interpretation of these three conditions as being necessary for information to have salutary impacts on public goods or governance. We argue there, however, that it is unlikely to be sufficient.

3. The information revolution

Access to information has exploded in recent years through at least two main developments: rapid technological advancements and institutional innovations. The first have generally come from the private sector while the latter have tended to come from the public sector. Both promise to increase the spread of information, including in relatively less-connected rural areas. In doing so, they promise to change not only rural livelihoods, but also rural governance itself.

Recent technological innovations, like mobile phones and the Internet, are becoming widely available both in developing countries and rural areas (Aker & Mbiti, 2010; Donner & Escobari, 2010; Kahn, Yang, & Kahn, 2010). Worldwide, mobile phone subscriptions exceeded one per person on average in 2016, the result of a precipitous climb over the last 20 years (see Fig. 1). While low-income countries unsurprisingly have lower levels of adoption, they still have about 60 mobile phone subscriptions per 100 individuals; that is, the average individual in a low income country is more likely to have a mobile phone subscription than not. Further, individuals who cannot access their own mobile phone often have occasional access to the mobiles phones of other individuals (Pew Research Center, 2015). Fig. 1 also reveals that low income countries have seen growth rates in access to mobile telephony over the last 20 years similar to the global average growth rate.

Smartphones are becoming more common as individuals' demand for information rises and the cost of information technology declines. For example, South African startup Onyx Connect recently announced plans to sell a \$30 smartphone, which has been called a game-changer (Scott, 2017). These and other smartphones are undoubtedly helping push Internet access to all-time highs in low income and high income countries alike (see Fig. 2). The rate at which high income countries are adding new Internet users has begun to decline in the last five years, but the rate in low income countries has grown rapidly, a movement helping bridge the digital divide between poor and rich countries. While data on access to mobile phones and Internet in rural areas specifically are more limited, they suggest trends similar to those seen in low income countries: precipitous increases in the last decade.

Mobile phones have implications beyond helping farmers, fishermen, and traders to check the prices of their goods (Aker & Fafchamps, 2014; Aker & Mbiti, 2010; Jensen, 2007). When the Ebola epidemic struck Nigeria and Liberia, health workers deployed GPS-enabled smartphones loaded with apps to provide real-time updates to control centers. This played a key role in response efforts (Hancock, 2015). In China, mobile phones are one part of a broader business-to-consumer e-commerce platform called Ule that connects 250,000 rural stores with customers;¹ they can search for goods from electronics to finance products, all delivered by China Post (Rowan, 2017).² And social media is widely credited with helping to topple dictators during the Arab Spring, starting in 2011 (Howard et al., 2011). Mobile phones are also changing the way we pay. Globally, digital payments are already worth more than US\$2 trillion, and expected to grow 16% annually through 2021 (Statista, 2017). Of course, it is important to head the warning of Aker and Mbiti, 2010 that mobile phones are not the "silver bullet" for development; institutions that support the provision of productive public investments are also needed.

Not only is Internet access at all time highs, but Internet speeds continue to climb as well. In 2014, 2015, and 2016, global Internet speeds increased by 30%, 23%, and 15%, respectively. While this

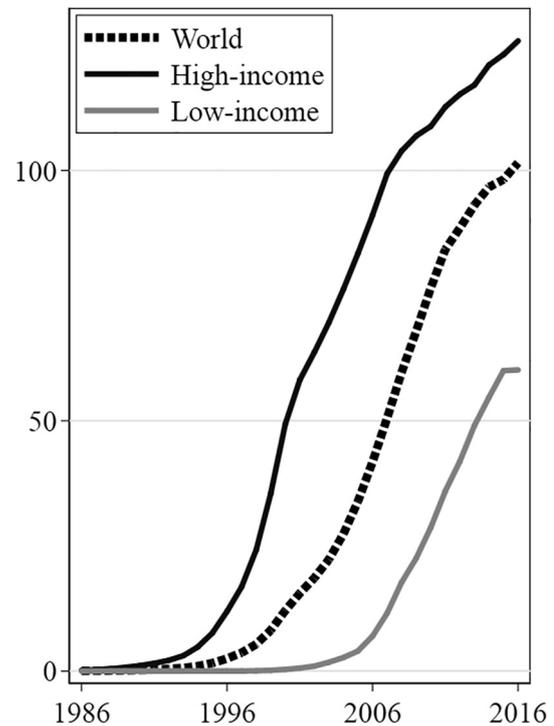


Fig. 1. Mobile cellular subscriptions. Source: World Bank (2017). Notes: "High-income" and "low-income" are country-level designations. Mobile cellular subscriptions are measured per 100 people.

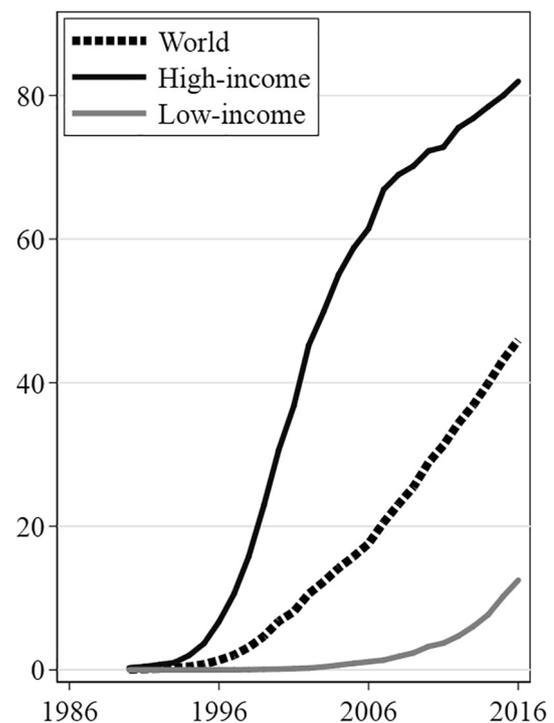


Fig. 2. Individuals using the Internet. Source: World Bank (2017). Notes: "High-income" and "low-income" are country-level designations. Individuals using the Internet is measured as the share of population.

¹ As of August 2017.

² A company chairman expected that transactions on Ule would soon exceed 200 billion RMB (the exchange rate is approximately 0.15 USD = 1 RMB) and noted that their goal is to connect 500,000 rural stores in 2017.

suggests a leveling off of the rate of increase, the annual increase remains positive and large. Further, in each year the rates of increase were largest in countries with lower initial speeds, consistent with catch-up occurring (Akamai, 2015, 2016, 2017).

One use of the Internet is to connect citizens with politicians. One way is through so called “e-governance”—a phenomenon that stands to fundamentally change state–society interactions. For example, many governments now allow citizens to obtain records and information, download and submit forms, upload bids and proposals, and provide feedback on government performance online. The frequency of these interactions tends to grow with Internet speed (Eurostat, 2010)—and thus can be anticipated to become more frequent in the coming years. Some governments have also begun allowing citizens to contact policymakers with mobile phone messaging, which has been shown to boost voter turnout (Aker, Collier, & Vicente, 2017). Encouragingly, allowing this form of contact has been shown to benefit poor and marginalized citizens the most, thus flattening the income gradient in access to policymakers (Grossman, Humphreys, & Sacramone-Lutz, 2014).

Higher level public officials are also increasingly monitoring frontline service providers using new technologies. For example, service providers in many settings are now being required to share their GPS coordinates, take digital photographs, or record videos. Further, studies show that these technologies can improve civil servants’ performance (Duflo, Hanna, & Ryan, 2012).

Governments are also using technology to improve their record-keeping and targeting of public services. For example, in 2003, then WHO Director-General Jong-wook Lee said, “To make people count, we first need to be able to count people” (Lee, 2003). Since then, technology has helped spur substantial global progress in strengthening civil registration and vital statistics systems affecting government sectors including registration, justice, health, statistics, and civil society (AbouZahr et al., 2015). In addition to counting people, technology is also counting infrastructure, dwellings, and the locations of poverty itself. For example, satellite images of nighttime lighting and high-resolution daytime images are being successfully used to estimate household consumption and assets (Jean et al., 2016); this creates the potential for governments to use these data to estimate the incidence of poverty and thus potentially better target public goods to the neediest citizens. Governments are also beginning to distribute cash transfer payments using mobile money (Aker, Boumniel, McClelland, & Tierney, 2016) and other technology-based payment mechanisms (e.g., debit cards and smart cards) that were once rare in poor, rural settings and are now becoming ubiquitous (World Bank, 2015).

In addition to greater access to information, the ability to process information has also grown exponentially in recent years. More powerful computers and advancements in the ease of transferring and storing data have especially benefited the field of machine learning. Machine learning imagery applications, from microscopic to satellite, show promising results. For example, Quinn, Andama, Munabi, and Kiwanuka (2014) show, in Uganda, that it is possible to accurately diagnose malaria with smartphones in real-time, saving precious time and resources. Mohanty, Hughes, and Salath (2016) set out to identify plant diseases based on pictures of leaves; they developed an algorithm (that can be run on a smartphone) that can correctly detect crop disease before it spreads. And, Jean et al. (2016) identify poverty in several African countries using inexpensive satellite imagery instead of expensive household surveys.

Along with copious amounts of information, of course, comes the difficulty for the recipient of separating relevant and accurate information from irrelevant and inaccurate information. That is, there may be a “cost” of greater availability of information. The increasing prevalence of “fake news” is one manifestation of this problem, and we know that individuals are more likely to believe fake stories if they confirm pre-existing beliefs and biases (Allcott & Gentzkow, 2017). Fortunately, the information revolution that has generated this problem may help solve it; for

example, applications of machine learning are being used to detect the veracity of news stories and flag fake ones (Conroy, Rubin, & Chen, 2015).

At the same time that technological progress has contributed to an information revolution, institutional innovations have also increased citizens’ information about and influence over the policymaking process itself. This is seen, for example, in the rising prevalence of community driven development (CDC) initiatives, town hall meetings, government transparency initiatives, and devolution of responsibilities down to the local level where they can in theory be more readily influenced by citizens. These initiatives have the potential to further increase access to information, potentially creating a virtuous cycle, if they truly empower participants. That is, if the policy generated through community participation ends up being close enough to the one implemented.

While wide-reaching technological and institutional innovations are increasing access to information, their impact on rural areas is more limited. For example, despite rapid increases in use of mobile payments, just 8% of mobile payment users live in rural areas (Buckle, 2017). Individuals’ physical and human capital may also limit their ability to absorb information or use new technologies. For example, there is a substantial education gradient in utilization of e-governance services (Eurostat, 2010). This might limit the ability of information to contribute to poverty alleviation in rural areas. This poses challenging questions of how information can be harnessed in these more challenging rural settings.

4. When does information lead to desired outcomes?

Information is no panacea. As we discussed in our review of the literature, there are ample cases of efforts to expand access to information—either for individuals or for policymakers—that have yielded few if any benefits for rural governance or service delivery. In this section, we provide one explanation for this fact: for many governance-related outcomes, information alone is insufficient to improve them. In particular, three necessary conditions must additionally be satisfied: the information must be relevant to the individual, the individual must have the power to act on it, and the individual must have the incentive to act on it. We consider each of these conditions in turn to provide a better understanding of why information may fail to yield hoped-for benefits.

4.1. Relevance

First, any information must be deemed relevant by the individual receiving it. By relevance, we mean that it touches on an issue or concern that is salient to the individual receiving it; information on other issues is likely to be ignored. It also means that the individual perceives the information to be accurate, credible, meaningful, and sufficiently specific in a world with increasingly more abundant information, much of which is noise. Sifting through copious amounts of information and separating the important and accurate from other information exacts a time burden and possibly requires education and skills that poor and vulnerable individuals especially may lack. Especially in settings where there is conflicting information, the burden becomes even larger; individuals must be able to discern true from “fake” news in a world in which the quality of information is rarely certified.

Several of the papers in this special issue reveal precisely how a lack of relevance can make information fail to impact governance and service delivery. For example, Boas and Hidalgo (2018) provide an illustration of the necessity that information be salient. In the context of Pernambuco, Brazil, they consider the political impacts of informing voters about their mayor’s use of federal funds to combat mosquito-borne illnesses. They demonstrate that this

information had little to no effect on voting for the mayor's reelection; only among voters who knew someone affected by microcephaly (a condition in which a baby's head is significantly smaller than normal, often due to abnormal brain development) or the mosquito-borne Zika virus that causes it did receiving negative information about government mosquito control efforts prompt electoral sanctioning. Expanding on their results with focus group evidence, they argue that voters generally fail to act on mayoral performance information because mosquito control is a low-salience concern primarily associated with endemic (and thus perceived to be inevitable) diseases rather than epidemic ones. While the international community was exceedingly worried about Zika, locals in especially vulnerable communities were less so—precisely because their life-long exposure inured them to mosquito-borne threats. This underscores the need to consider how new information interacts with existing information and perceptions to influence its perceived relevance.

In addition to being salient, being relevant also requires that information contain a high signal-to-noise ratio. Grossman, Platas, and Rodden (2018) nicely illustrate its importance. They found that a new information communication technology platform in Uganda allowing citizens to send free and anonymous text messages to local government officials did not improve service delivery outcomes. The reason in large part was a low signal-to-noise ratio; even if policymakers shared citizens' concerns with service delivery outcomes and wanted to act on them out of electoral or other motivations, complaints were generally too vague—either in the nature of the problem, the desired solution, the geographic area affected, or some other key detail—to make them actionable. This had the effect of rendering the text messages irrelevant. Additionally, because messages could be sent freely and at virtually no cost (only time), it was also difficult for individuals to signal the importance of their concerns. The result was that the messages were generally received as noise by local government officials, and consequently ignored. This work raises the question of whether making information costly to provide may actually be more effective than making it free; cost might help signal the value of the information to its sender, and might induce users to better consider how to make their message clearer and more specific.

Relevance may also be conditioned by the identity of the sender. For example, Batista, Seither, and Vicente (2018) demonstrate in the context of Mozambique that when international migrants exposed to better quality political institutions abroad return home and talk with others, this leads to greater political participation and electoral knowledge for those in their social networks. But importantly, improvements due to contact with migrants seem to be largest when the return migrant is a regular chatting partner, as opposed to simply a geographic neighbor or even a family member. Chatting partners appear to provide highly relevant information about political processes and their importance, as well as about changing social norms, and this information is then highly influential in spurring those in their networks to be politically engaged. The authors thus provide evidence that assumptions that family members are the most influential conveyors of information may be unfounded, and emphasize the need to understand an individual's social network and interactions when considering how to use information in the hands of citizens as a vehicle to bring about improved governance.

Relevance also implies that information is new and useful. If individuals already know something, or if the information is not useful given other sources of information that are present and trusted, then it is unlikely to be acted upon. For example, Jablonski et al. (2018) look at voter choices in Ugandan districts and find that new information on irregularities in local government budgets provided by text message only affects vote choice for lower-level politicians. For higher-level politicians, voters have

greater reliance on other, pre-existing sources of information, and so are more likely to disregard any new information provided. Christian, Kondylis, Mueller, Zwager, and Siegfried (2018) also provide a useful illustration of the importance of information being perceived as new and useful. They show that providing farmers with information on the necessary water usage at each crop growth stage eliminates inefficient watering practices—in which too much water is used at some times and too little at others—and eliminates conflicts over water. However, combining this information with additional information on actual personal water usage had no added effect. Either individuals already knew how much water they used, such that the information was not perceived as new, or knowing the amounts of water they should use at each growth stage provided all of the necessary information to guide future water use, rendering knowing own water use irrelevant.

Finally, to be relevant, information must also be understood. Arias, Larreguy, Marshall, and Querubín (2018) conducted a field experiment around Mexico's 2015 municipal elections to test how the effect of providing voters with incumbent performance information varies with the content and form of the information shared. They found that, compared with simply distributing leaflets with information about a Mexican mayor's performance on an audit, additionally benchmarking mayors' performance against that of other mayors in their state had no additional impacts on beliefs or voting behavior. Voters either did not understand the benchmark or otherwise did not believe it to be relevant. This is a caution against assuming that the information provided was heard and understood as intended.

4.2. Power to act

Second, individuals who receive information must have the power to act on it. In the case of policymakers, their capabilities and mandates must place them in a position in which they can meaningfully change their behavior in response to information, to thus bring about desired governance and public service delivery outcomes. In the case of citizens, their rights as citizens and their position within the community—in which elite control is often present, and poor and rural citizens often have low physical mobility—must permit them to respond to the information they receive. Here it is also important to distinguish *de facto* and *de jure* power to act; especially in rural, developing country settings, the poor often lack the ability or capacity to act on information they receive. In such cases, despite having *de jure* power to act, the poor may lack *de facto* power—which is essential if they are to be considered truly empowered.

Mogues and Olofinbiyi (2018) illustrate the importance of aligning information with power and authority in their study of the multiple levels of governance determining agricultural policies in Nigeria. The agricultural sector is critical for productivity and food security, and for rural livelihoods in particular. The authors perform both qualitative and quantitative analysis of three different types of information asymmetries: between elected politicians and bureaucrats; between higher- and lower-tiers of government; and between citizens and political leaders. They show that in the case of Nigeria—as in other African contexts—those with superior information and expertise about agricultural issues often do not have sway over how public resources to the agricultural sector are allocated or even the allocation across individual projects and activities within agriculture. Those making decisions tend to have inferior technical knowledge. Further, while the information of local policymakers should in theory be superior to that of state policymakers, local government budgets are subject to an overwhelming level of control by state-level actors. This situation of those who have information not having the power to act on it helps

explain the passage of inferior policies with little positive welfare impact for citizens. If information is to improve public service delivery in this and similar contexts, they show the importance of better matching information and expertise with political power.

Buntaine, Daniels, and Devlin (2018) demonstrate the importance of citizens having power in their study of a community-based development project in villages near Bwindi National Park in Uganda. They found that sending citizens targeted and timely information about when and how they could participate in project planning did little to affect either their or policymakers' behavior. In particular, sending them approximately 60 text messages over an eight month period about how a park-sponsored revenue sharing program worked and how and when residents could participate did not improve knowledge, participation in project planning, perceptions of government efficacy, or satisfaction with local institutions. The authors' work suggests that this occurred because the information made salient the fact that these individuals had been traditionally excluded, and did not permit individuals to surmount social barriers preventing them from influencing the decision-making process. For women—a particularly marginalized group in Ugandan society—the information even backfired, having significant negative effects on their perceptions of opportunities to participate in project planning. The authors show that not only is information without power unlikely to improve rural governance, but also that it is important to take into account individuals' existing information sets as well as their position in their community (e.g., in this case, their level of marginalization).

4.3. Incentives to act

Finally, individuals receiving information must have incentives to act on it. That is, acting on the information must be payoff relevant and it must be net beneficial to do so. There are many reasons, however, that this may not be the case—either for policymakers or for citizens. For the case of policymakers, political budget cycles may explain a failure to act on information; if the returns on investments will not be realized while the policymaker remains in office and can benefit from them, she may be loathe to make such investments. For example, Mogues and Olofinbiyi (2018) discuss how public investments can be biased toward the construction of highly visible but low return or inefficient projects; even if policymakers receive information that a low-visibility project will yield high-payoffs in the long-run, the timing of these payoffs and elections may not incentivize such an investment. In their study context, this tendency helps explain low investments in agricultural public services in particular.

Similarly, Evans, Holtmeyer, and Kosec (2018) show that greater flows of information may encourage local leaders to improve government record-keeping, but they will be biased toward doing so in domains in which government higher-ups and those providing transfers to them explicitly place emphasis. In particular, the authors show that a local community-managed conditional cash transfer program in Tanzania that conditioned transfers on attending schools and health clinics led local leaders to keep better records of school and health committee meetings—with these effects mostly coming from villages with more frequent community meetings, which help disseminate information about local government performance. But it had null impacts on other record keeping, including records of security and finance committee meetings. Once again, we see government incentivized by information (in this case, information flowing from community meetings, possibly to other policymakers), but only in domains in which their efforts are highly visible and may yield benefits (in this case, continued transfer payments).

Incentivizing action also requires an understanding of existing barriers to action—information-related or not—and whether or

not information is sufficient to tear them down. If it is not, information may have no impact. For example, Arias et al. (2018) found that, compared with simply distributing leaflets with information about a Mexican mayor's performance on an audit throughout the community, accompanying the leaflet delivery with a loud speaker announcing that the leaflets were being delivered had no additional impacts on beliefs or voting behavior. Despite increasing common knowledge, the loudspeaker did not significantly incentivize voter coordination. Such coordination may be sufficiently costly or have such low perceived payoffs that information alone is not enough to ensure that it occurs. In such cases, the information delivery mechanism may need to be altered or some additional intervention may be needed to incentivize individuals to act on the information.

5. Bringing information, power, & incentives together

Several success stories suggest that when relevant information, power, and incentives are brought together, this can improve governance-related outcomes. For example, Kumar et al. (2018) show that belonging to a self-help group in India made women more likely to have a voter ID card, to have voted in the last election, to attend the gram sabha (village council meeting), and to believe that the gram panchayat (village council) was responsive to their needs. They were also more likely to participate in public entitlement schemes. The information provided by these groups was relevant; members could benefit from the labor and support of other members, and entitlement schemes were important in a context of extreme poverty. These same motivations incentivized women to act on the information. And the support provided by the groups gave women the power and voice to take action. Improved access to social protection and political influence were the result of the combination of relevance, power, and incentives.

Wantchekon and Riaz (2018) also show how combining information with power and incentives can yield beneficial outcomes for the rural poor by pressuring governments to respond to food crises. They show how mobile phone coverage serves as a vehicle through which rural citizens can articulate their demands via protests typically concentrated in urban areas. When rural residents do not have the capacity to mobilize or when rural protests are ineffective due to the political marginalization of these residents, information technology can help connect these residents with urban-dwelling individuals in their network, thus enhancing their agency and persuasiveness. By better connecting rural residents with others in their network, mobile coverage turns information into a coordination device that lends power to rural residents. Rural residents are incentivized to reach out due to their own interest in their food security and the low costs of mobile access, while urban residents are incentivized to act due to their close relationship with rural individuals. Once again, the constellation of relevant information, power, and incentivizes can yield increased food security.

There do, however, appear to be outcomes for which information can have desired, beneficial impacts even without power and incentives in place. Specifically, when outcomes are perceptions, attitudes, and preferences, as opposed to concrete changes in policy, information alone may yield improvements. Evans et al. (2018) provide an example; they show that a local community-managed conditional cash transfer program in Tanzania improved trust in leaders most when there were ample community meetings preceding program implementation. While community meetings and the information conveyed at them did not necessarily provide a lot of power and incentives to take costly action to individuals—after all, the authors found little evidence that communities with more versus fewer of them differed appreciably—they did allow

for the flow of information, and contributed to the cash transfer program improving perceptions of leaders. In contrast to impacts on trust, however, the authors found null impacts on more concrete outcomes, like government transparency. Keefer and Khemani (2018) provide another example; they show that access to community radio leads citizens to throw their support behind policymakers offering public goods in the areas of health and education, as opposed to favoring policymakers offering private transfers. The mechanism they point to is the fact that greater access to radio led to greater exposure to programs about the importance of health and education. Once again, their outcome is a perception-based outcome. Even though radio did not provide power and incentives to act, the information it provided was deemed relevant and was able to sway perceptions. Generally, however the most important outcomes relate to the goods governments provide and the laws they pass and uphold rather than perceptions alone. This suggests the importance of individuals having the power and incentives to act on information.

6. Necessary? Sufficient?

Thus far, we have argued that there are a number of potential barriers to information improving rural governance and service delivery. Specifically, if information is not perceived to be relevant, if the individual receiving it does not have the power and ability to act on it, or if the individual does not have incentives to act on it, information may fail to bring about positive impacts. A systematic review of the literature, summarized in Table 1, supports our interpretation of these three conditions as necessary ones. Here we summarize all of the 48 empirical studies on the impacts of information cited in this article (including papers in the special issue), listing the nature of the information studied, whether or not the recipient found it relevant, whether or not they had the power to act on it, whether or not they had incentives to act on it, and the main service delivery and/or governance outcomes considered (characterized as either positive, mixed, zero (i.e. null), or negative).³ Of the 48 studies, for 28 (i.e. 58 percent of them) information had an overall positive impact, while for 20 (i.e. 42 percent of them) it had mixed, zero, or negative impacts. However, we find that in no case did information have positive impacts when any of the three conditions was missing. And for every case of a study finding mixed, zero, or negative impacts, at least one of the three conditions was missing (an average of 1.25 of the three were missing, across these 20 studies). This provides evidence supporting our interpretation of the three conditions (relevance, power, and incentives) as necessary ones.

On the issue of sufficiency, any theory of change underlying information's effects on rural service delivery and governance would likely suggest that the three conditions are not sufficient ones. Even when recipients of information act upon it, other actors may have the power to (intentionally or unintentionally) block them from bringing about service delivery or other governance improvements. What is key is whether a lack of information is indeed the binding constraint in the first place. If it is not, provision of information may not have beneficial effects, even when acted upon. For example, if informed citizens in a democratic political system aim to hold a public official accountable, this may only lead to a positive outcome if the official is competent, willing, and able to take the proper course of actions. A whole host of personal competencies and political incentives may disrupt this. Ultimately, incentives must exist on two sides: on the side of those wishing

to bring about a policy improvement and on the side of those with the power to facilitate or block it.

Another reason that having all three conditions in place may be insufficient to ensure improved service delivery and governance relates to the nature of the information. Consider the case of information that tends to undermine law and order. Examples include the government releasing statistics on the low probability of being caught on tax evasion, or on its own lack of capacity to deal with an imminent terrorist threat. Such information could increase tax evasion—thus leaving fewer funds to supply public goods—or even undermine the government's ability to provide security by inciting chaos. This underscores the critical importance of carefully considering the theory of change surrounding provision of information—both for policymakers and practitioners and for researchers.

7. Conclusion

This special issue aims to push forward the research agenda on the way information shapes governance and rural development. The increasing prevalence and quality of information is raising new questions about the impacts of that information while also equipping researchers with better tools and data inputs to answer fundamental questions for development. The increasing availability of information is also occurring hand-in-hand with institutional innovations and other efforts to stimulate citizen involvement in the policymaking process. The papers in this special issue give policymakers, development practitioners, and researchers alike new insights into how information can be harnessed to improve rural service delivery and governance. They highlight the importance of taking the institutional context, the type of information, and the information transmission mechanism seriously. We learn from them that information alone is insufficient; the information must simultaneously be relevant to its recipient, and they must also have both the power and incentives to act on it. When one of these three ingredients is missing, information will not have its intended, salutary effects.

This raises important questions about the conditions that can bring about the constellation of information relevance, power, and incentives. Doing so is challenging, especially in rural, developing country settings where education levels, mobility (and thus the ability to “vote with one's feet”), and mechanisms of political accountability are often low. Government wields tremendous power to either help bring about or actively block the constellation from coming together. On the one hand, when government actors engage in activities like setting up government websites, subsidizing access to communications technologies, publicly posting information and encouraging citizen dialogue, or otherwise involving citizens in decision-making, they can help bring the constellation about. On the other hand, they can work to undermine it; for example, politicians may engage in vote-buying to ensure that voters with relevant information which they have the power to use to extract effective and efficient public expenditures lack the incentives to do so (Cruz et al., 2016). While government plays an important role, non-state actors can also be critical in bringing the three about—even without the explicit support of the government (or even with its active resistance). For example, the media, grassroots civic organizations, NGOs and development practitioners, or even researchers can provide relevant information in settings where power and incentives are likely to be present. And the same types of actors can engage in civic education and capacity strengthening campaigns to help individuals understand how to seize the power that existing formal and informal institutions offer them to effect policy change.

To have an impact, this special issue implies that randomized control trials and other experiments involving information must

³ We provided this task to a research assistant, asking them to objectively code studies according to the definitions of relevance, power, and incentives advanced in this article.

Table 1
Summary of empirical findings on the effects of information on governance and service delivery.

Authors	Country	Type of information	Outcome	Direction of effect	Relevant?	Power?	Incentives?
Ahrend (2002)	Several (130)	Free press circulation	Corruption	Positive	Yes	Yes	Yes
Aker et al. (2017)	Mozambique	SMS information campaign, SMS hotline for electoral misconduct, and free newspaper circulation	Voter turnout, electoral problems, accountability-based voter engagement	Positive	Yes	Yes	Yes
Banerjee et al. (2011)	India	Politician report cards, on incumbent performance and candidate qualifications	Voter turnout, vote-share for more qualified candidate, vote buying	Positive	Yes	Yes	Yes
Batista et al. (2018)	Mozambique	Exposure to returning international migrants	Voter turnout, self-reported political participation	Positive	Yes	Yes	Yes
Besley and Burgess (2002)	India	Newspaper circulation and resultant electoral accountability	Public food distribution and calamity relief in wake of shortage and natural disaster	Positive	Yes	Yes	Yes
Besley and Case (1995)	United States	Local policymakers tax-setting behavior, benchmarked against neighboring state tax-setting	Election outcomes; tax rate changes	Positive	Yes	Yes	Yes
Brunetti and Weder (2003)	Several	Free press circulation	Corruption	Positive	Yes	Yes	Yes
Duflo et al. (2015)	Kenya	Governance program empowering parents of pupils in Kenyan schools with locally contracted teachers	Effort of civil-servant teachers; Fair hiring of contracted teachers	Positive	Yes	Yes	Yes
Duflo et al. (2012)	India	Camera monitoring of classroom	Teacher attendance	Positive	Yes	Yes	Yes
Evans et al. (2018)	Tanzania	Community forums orienting members to cash transfer program	Trust in leaders	Positive	Yes	Yes	Yes
Ferraz and Finan (2008b)	Brazil	Random audit of municipalities' use of federally transferred funds	Corrupt incumbent's performance in election	Positive	Yes	Yes	Yes
Fujiwara and Wantchekon (2013)	Benin	Town hall forums instead of clientelist rallies as part of presidential election	Voter turnout, candidate vote share	Positive	Yes	Yes	Yes
Gottlieb (2016)	Mali	Enumeration of local government responsibility and local government capacity through civics course	Town hall meeting behavior, survey evidence on attitudes toward government officials	Positive	Yes	Yes	Yes
Grossman et al. (2014)	Uganda	Subsidized information communication technology availability used to reach politicians	Usage of messaging service, by income quantile	Positive	Yes	Yes	Yes
Howard et al. (2011)	Tunisia, Egypt	Social media interactions during the Arab Spring	Number of politics-inspired blog posts and tweets	Positive	Yes	Yes	Yes
Jia et al. (2015)	China	Availability of information on provincial growth performance under incumbents to higher officials	Promotion of provincial leaders to higher positions	Positive	Yes	Yes	Yes
Keefer and Khemani (2005)	India	Existing differences in literacy, electorate, and transparency between states of Uttar Pradesh and Kerala	Health and education expenditures, collective action, total public good spending	Positive	Yes	Yes	Yes
Keefer and Khemani (2018)	Benin	Access to community radio	Survey respondent support for candidates that offer private benefits (jobs) instead public goods (health and education)	Positive	Yes	Yes	Yes
Kosec and Mogue (2017)	Ethiopia	Existing information asymmetries between local and central government officials	Service delivery outcomes	Positive	Yes	Yes	Yes
Kumar et al. (2018)	India	Women's self-help group participation	Participation in local government, voter registration, participation in public entitlement schemes	Positive	Yes	Yes	Yes
Olken et al. (2017)	Indonesia	Mailings with cash transfer program information to ultimate recipients	Average subsidy receipt of individual household	Positive	Yes	Yes	Yes
Peisakhin and Pinto (2010)	India	The Right to Information Act requirement for every federal and state office to have a dedicated employee to handle public inquiries	Access to ration cards for poor slum-dwellers	Positive	Yes	Yes	Yes
Reinikka and Svensson (2004)	Uganda	School system awareness of public school grant program	Funds captured by officials administering grant funds	Positive	Yes	Yes	Yes

(continued on next page)

Table 1 (continued)

Authors	Country	Type of information	Outcome	Direction of effect	Relevant?	Power?	Incentives?
Reinikka and Svensson (2005)	Uganda	Newspaper campaign encouraging parents to monitor misuse of public school grant funds	Enrollment and student learning	Positive	Yes	Yes	Yes
Wantchekon and Riaz (2018)	Several (African continent)	Mobile phone coverage as proxy for connectivity	Food outcomes, electoral participation, collective action	Positive	Yes	Yes	Yes
Strömberg (2004)	United States	Radio prevalence and programming	Receipt of New Deal relief funds	Positive	Yes	Yes	Yes
Wantchekon (2017)	Benin, Philippines	Policy-oriented campaign messaging, with input from constituents through town-hall meetings	Vote share, turnout	Positive	Yes	Yes	Yes
Wantchekon et al. (2017)	Philippines	Town hall, deliberative forums as method of campaigning in congressional election	Vote share, by demographic	Positive	Yes	Yes	Yes
Humphreys and Weinstein (2012)	Uganda	Scorecard on Parliament member's performance to voters	Parliament member's re-election chances, performance	Zero	No	Yes	Yes
Humphreys et al. (2012)	Dem. Rep. of Congo	Tuangane, a community-driven reconstruction program that exposed individuals to notions of better governance and social cohesion	Measures of good governance, transparency, trust, and social cohesion	Zero	Yes	No	Yes
Lieberman et al. (2014)	Kenya	Parent information on child's performance on literacy and numeracy tests, with advice on how to be more involved in learning	Public and private actions to help school and child's learning process	Zero	No	No	Yes
Mogues and Olofinbiyi (2018)	Nigeria	Existing information asymmetries between experts and elected officials, various levels of government, and between voters and officials	Agricultural resource allocation patterns	Zero	Yes	No	Yes
Ravallion et al. (2015)	India	Entertaining movie about individual rights in large antipoverty program	Participation rates, perceptions about program, employment, wages	Zero	Yes	No	Yes
Arias et al. (2018)	Mexico	Leaflet information on incumbent performance (with loudspeaker announcement and additional benchmarking)	Incumbent party vote share	Mixed	No	Yes	No
Banerjee et al. (2010)	India	Information on existing educational institutions, training for community members on testing children, and training volunteers to teach at remedial camps	Community involvement, teacher effort, learning outcomes	Mixed	Yes	No	Yes
Boas and Hidalgo (2018)	Brazil	Info on mayor's use of federal funds to combat mosquito-borne illness	Voting behavior,	Mixed	No	Yes	Yes
Buntaine et al. (2018)	Uganda	SMS messages to local community members about revenue sharing program in Bwindi National Park	Participation in Bwindi NP development projects, satisfaction in local institutions	Mixed	Yes	No	Yes
Casey et al. (2012)	Sierra Leone	Community development initiatives, to spur "learning-by-doing" in effective governance	Public good provision, economic outcomes, nature of participation by minorities	Mixed	Yes	No	Yes
Chaudhury and Parajuli (2010)	Nepal	Participatory decentralization of schooling governance, that leads to better informed management of schools	Education access and equity, learning outcomes, and school administration outcomes	Mixed	Yes	No	Yes
Chong et al. (2010)	Mexico	Information on incumbent corruption, spending behavior, and social programs	Voter turnout, incumbent election outcomes	Mixed	Yes	No	No
Conroy et al. (2015)	Mexico	Incumbent performance information	Voter turnout, incumbent election outcomes	Mixed	Yes	No	No
Christian et al. (2018)	Mozambique	General water use guidelines to farmers, with and without context of actual water use	Conflicts over water insufficiency	Mixed	No	Yes	Yes
Driscoll and Hidalgo (2014)	Georgia	Democracy promotion campaign, with details on how to file a formal complaint and monitor voter registry	Citizen activism, voter turnout	Mixed	No	Yes	Yes

Table 1 (continued)

Authors	Country	Type of information	Outcome	Direction of effect	Relevant?	Power?	Incentives?
Grossman et al. (2018)	Uganda	Platform to send anonymous messages to government officials	Service delivery outcomes	Mixed	No	Yes	Yes
Olken (2007)	Indonesia	Required government audits of all village road projects, and grassroots information for individuals to engage in community monitoring	Discrepancies in expenditure reports	Mixed	Yes	No	No
Cruz et al. (2016)	Philippines	Details on spending program, proposed allocations, and promises made by candidates in mayoral election race	Vote-buying	Negative	Yes	No	Yes
Jung et al. (2012)	Uganda	Encouragement to vote, accompanied by information on finger inking after vote is cast	Voter turnout	Negative	Yes	No	Yes
Protik et al. (2018)	Rwanda	Strengthening Civil Participation program promoted civic participation in local governance	Perceived access to, influence on, and satisfaction with government; Awareness of government meetings and affairs	Negative	No	Yes	Yes

Notes: Direction of effect refers to whether the effect of the information on the outcome is beneficial ("positive"), harmful ("negative"), mixed, or null ("zero"). Information is relevant when the recipients understand the message and find it meaningful and legitimate. Recipients have power if they have the political and social agency to act upon the information they receive. Recipients have incentives to act upon this information if the benefits and costs of using the information are not too low or too high, respectively.

consider pairing information with true power and incentives to act on it. And community driven development and other initiatives of governments must similarly incorporate an institutional architecture that ensures that informed individuals will indeed be given voice and influence. Bringing all three of these factors together (relevance, power, and incentives) is no doubt challenging. It is not only challenging because actors in one sphere (e.g., the government) might counteract efforts made by actors in another sphere (e.g., civil society), as discussed above. It is also challenging since bringing all three factors together requires knowing, in advance, what are the likely impacts information will have—despite the natural unpredictability of human behavior and the myriad factors that might moderate these impacts. For researchers, this highlights the importance of qualitative work to accompany and inform the design of and theory of change surrounding randomized control trials. However, it also suggests reasons to temper enthusiasm about the prospects for information to generate accountability. More modest goals may be more appropriate (e.g., increases in knowledge rather than immediate changes in behaviors or in policies)—at least in the short-term. Longer-term studies of sustained interventions might help shed light on the potential pathways to changing actual service delivery outcomes and policies. For governments and practitioners, it suggests benefits for piloting interventions, with keen attention to the various stakeholders involved and aspects of the policy environment that are likely to influence information relevance, power, and incentives.

While bringing information, relevance, and power together at the same time is ideal, a final word of caution is warranted. Sometimes, information might be of intrinsic value. When individuals lack power and see information as irrelevant, providing information can help change that. By gaining exposure to information, individuals may begin to perceive its relevance, and they may eventually demand the power to act on it. An illustrative example we cite is that of the history of civil rights in the United States. Receipt of information about individual rights was used by civil rights leaders to mobilize individuals to demand action and eventually bring about institutional change. This highlights the importance of considering not merely the current relevance of information and the current power and incentives of individuals, but also how they might change in the future.

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