The Rise of African SIM Registration:

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The rise of African SIM registration: The emerging dynamics of regulatory change

by Kevin P. Donovan and Aaron K. Martin

Abstract

The African experience with mobile telephony has been extolled as a defining moment in the continent's contemporary economic, social, and political development. Yet SIM (Subscriber Identity Module) registration schemes are threatening to throttle the technology's developmental potential. These mandates, which require the registration of identity information to activate a mobile SIM card, are fast becoming universal in Africa, with little to no public debate about the wider social or political effects. Whereas some authors have explored the motivations behind these drives, as well as their potential economic impacts, this paper focuses its critique on the broader diversity of implications of this regulatory transformation. Viewing SIM registration through a lens that combines surveillance studies and information & communication technologies for development, it examines elements of resistance across a range of actors, as well as other emerging effects like access barriers, linkages to financialization, and Africa's budding mobile surveillance society.

Contents

I. Introduction: The rise of the African mobile society

In 1999, only 10 percent of the African population was covered by a mobile signal; ten years later, that figure was 60 percent (Aker and Mbiti, 2010). Today, of the six billion mobile subscriptions globally, approximately 695 million are in Africa (Baker, 2012), which is currently home to over a one billion people. More than 735 million subscribers were expected in Africa by the end of 2012 (GSMA, 2011) and it is estimated that it will have one billion subscribers by at least 2016 (Reed, 2011). Although beginning with basic phones and low–bandwidth connectivity, Africans increasingly have

access to high–quality 3G networks and affordable smartphones (Minges, 2012).

In contrast to OECD (Organisation for Economic Co–operation and Development) economies where mobile telephony exists alongside significant fixed broadband usage, in Africa a wide variety of activities are concentrated onto the mobile device. As these devices increasingly access high–bandwidth networks and applications, Africa may continue to 'leapfrog' fixed infrastructure such as landlines and broadband, leading some to discuss a "mobile first" (Kelly and Minges, 2012), "mobile–centric" (Donner and Gitau, 2009), or even "mobile only" (Donner, *et al.*, 2010) paradigm.

However, the concomitant privacy and surveillance implications of portable, ubiquitous mobile connectivity in Africa are, at the moment, largely overlooked. One of the key modalities of Africa's emerging mobile–centric surveillance society is the rise of SIM registration requirements. These regulations require mobile phone users to provide personal identification details in order to purchase and/or use a SIM card. They are now in effect in the majority of African countries and have a range of implications for inclusion, surveillance, and development.

In the sections that follow, we first embark on a theoretical discussion that links the literature on information and communication technologies (ICTs) and development with social studies of surveillance. Next we discuss our methodology before documenting the rise of SIM registration policies and the drivers of this regulatory transformation. We then detail a range of emerging effects, with a particular focus on resistance, as well as evidence of an unfolding barrier to mobile communications access and linkages to the financial inclusion agenda. Finally, we discuss the wider implications of SIM registration within the framing of African telecommunications and surveillance.

II. Theoretical backdrop: Linking ICT4D & surveillance studies

In the past 20 or so years, a significant body of research and practice has coalesced around the use of information and communication technologies for development (ICT4D) [1]. This literature joins together a variety of methodologies and disciplines, including from major aid institutions, universities, civil society, and industry (see Kleine and Unwin, 2009). Early efforts sought to bring the perceived benefits of telephony and the Internet to low–income areas, bridging the so–called digital divide that Norris (2001) and others documented emerging both between industrialized and developing countries as well as within countries. This focus on inclusion — as variably manifest (Warschauer, 2003) — has been historically pre–eminent, motivating a range of efforts to boost access, from telecenters to market reforms.

Over the past 10 years, considerable gains have been made following the rapid spread of mobile connectivity, although access remains unevenly distributed by geography, gender, and income. The reduction in barriers to mobile connectivity is generally attributed to a number of causes, most notably market liberalization and privatization, the availability and sharing of low–cost handsets, and business models that lower the cost of access, such as prepaid airtime (Castells, *et al.*, 2007). These transformations have yielded a large body of research on the positive relationship between economic and social development and the growth of mobile telephony (Aker and Mbiti, 2010). A variety of cross–national assessments suggest a positive relationship between GDP growth and the diffusion of ICTs (Waverman, *et al.*, 2005; Qiang and Rossotto, 2009). On a microeconomic level, mobile diffusion has been shown to improve market efficiency and both producer and consumer welfare, especially in agricultural markets that predominate in developing countries (Jensen, 2007; Muto and Yamano, 2009; Goyal, 2010). Additionally, mobile phones and services can improve the ability of the poor to share and mitigate risks: in Kenya, the mobile money service M–PESA of the dominant operator, Safaricom, is associated with a marked enhancement in the ability to manage exogenous shocks (Jack and Suri, 2011). Such innovations are improving service delivery in sectors as diverse as healthcare, agriculture, financial services, and governance (Kelly and Minges, 2012), and contribute to the widespread belief in the democratic potential of ICTs (*e.g.*, Howard, 2010).

While directly related to these concerns, this paper is also positioned within a literature that is surprisingly rarely connected to ICT4D efforts: the social

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study of surveillance. This field, too, is concerned with the implications of new ICTs, though unlike ICT4D, its studies are typically located in the global North. Furthermore, where ICT4D historically seeks to understand access barriers and how to reduce them, surveillance studies explores the broader consequences of increased ICT access and use. Specifically, it examines the social, political, and criminological implications of the adoption and use of new ICTs and business models based on the collection and processing of personal data — whether identifiable or not [2] — as well as new policies and laws with data registration and monitoring components.

Sociologists view surveillance as a mode of categorization, social sorting (Lyon, 2003), and discrimination (Gandy, 2009): it facilitates the observation and tracking of people and objects, their labeling and subsequent organization, and the value judgments based on these orderings. Studies of surveillance are concerned with how these practices facilitate the control of populations and how surveillance affects people's life chances and choices. They also seek to reveal the logics, operations, and consequences of the underlying systems, and the attendant ethics. Scholars also explore how information societies over time become surveillance societies and the unintended but nevertheless harmful outcomes of these transformations. Scholars of surveillance are thus generally critical of the phenomenon, especially its modern forms that more and more rely on ICTs and opaque algorithms (Graham and Wood, 2003) to process people, bodies, and data at scale and in real–time. However, others stress the potentially beneficial and emancipatory aspects of surveillance, especially in contexts in which careful consideration has been paid to ethical concerns, social values, and the complex interplay between the surveillance mission and its stated objectives (*e.g.*, Murakami Wood and Firmino, 2009).

Theoretical treatments of surveillance tend to debate the most appropriate metaphors and models to describe phenomena. Despite their popular appeal, few surveillance scholars today consider George Orwell's Big Brother or Michel Foucault's panopticon as realistic models for contemporary surveillance. In 1990, Mark Poster described the "super–panopticon" in terms of a "system of surveillance without walls, windows, towers, or guards" [3]. A decade later, Haggerty and Ericson (2000) argued that "we can now speak of an emerging 'surveillant assemblage'" — a heterogeneous network that abstracts humans into distinct 'data doubles' to "be scrutinized and targeted for intervention." Their formulation is the leading theoretical conceptualization of surveillance today and is one to which we will turn in the discussion.

III. Methodology

This paper focuses on a major — though largely unremarked upon — shift in the regulatory structure of African telecommunications that requires prepaid mobile users to register personal identification information with the government, usually with a network service provider as an intermediary. These SIM registration requirements are now in effect in nearly all African countries, but scholarly assessment is almost completely absent. What analysis does exist is scattered through media, civil society, and industry sources. To begin filling this lacuna, this paper collects the results of research conducted in 2012–2013. Building on the previous work of Jentzsch (2012), in October 2012 we completed an exhaustive survey of the status of SIM registration requirements in African countries. This was subsequently revisited and updated in August 2013. During this work, we also extensively reviewed the public record on SIM registration, primarily relying on media and civil society reports. This was complemented by a series of conversations with experts in civil society and intergovernmental organizations, including representatives of the GSM Association, MobileActive, World Bank, African Development Bank Group, United National Development Programme, OECD Secretariat, the Media Institute of Southern Africa, and Research ICT Africa [4].

IV. Mobile communications surveillance on the African continent: The case of SIM registration

The widespread diffusion of mobile connectivity across Africa has been accompanied by the generally unremarked and underappreciated adoption

of policies, processes, and practices for mobile communications surveillance. These developments include government policies for mobile data retention by telecommunications service providers (in which these companies store call detail records on behalf of the police and security agencies for a specific period of time) (*cf.*, Whitley and Hosein, 2005), law enforcement use of specialized surveillance equipment such as IMSI catchers [5] to eavesdrop on communications and to track the location of mobile devices, and policies for the government registration of SIM cards with personal information such as name, national identification number, address, photograph, fingerprints, and so forth. For unregistered SIM card users the standard penalty is network disconnection. What is particularly interesting about SIM registration as compared to other forms of communications surveillance is that registration requires the active participation of the user, with direct consequences (*i.e.*, loss of access) for failing to comply.

Of the 55 countries in Africa, as of February 2014 at least 49 require or are in the process of requiring the registration of personally identifiable data in order to activate a prepaid SIM card (see Figure 1) [6]. In many cases, these laws require substantial penalties including fines and imprisonment. This is a notable change from just a few years ago. Prior to 2006, none of the countries in Africa had such a policy in place — across the continent one was able to purchase a prepaid card and use it more or less anonymously. In contrast to wealthier markets, African mobile telephony is overwhelmingly prepaid (Kelly and Minges, 2012), a structure that enabled access for populations without credit records, fixed addresses, or reliable income, but which has also resulted in much greater anonymity for users. The GSM Association (2013b) recently estimated that 95 percent of African SIM cards are prepaid. The growth of SIM registration mandates might be understood as a general reaction to this. More specifically, there are a few apparent reasons for this sudden adoption of SIM registration policies.

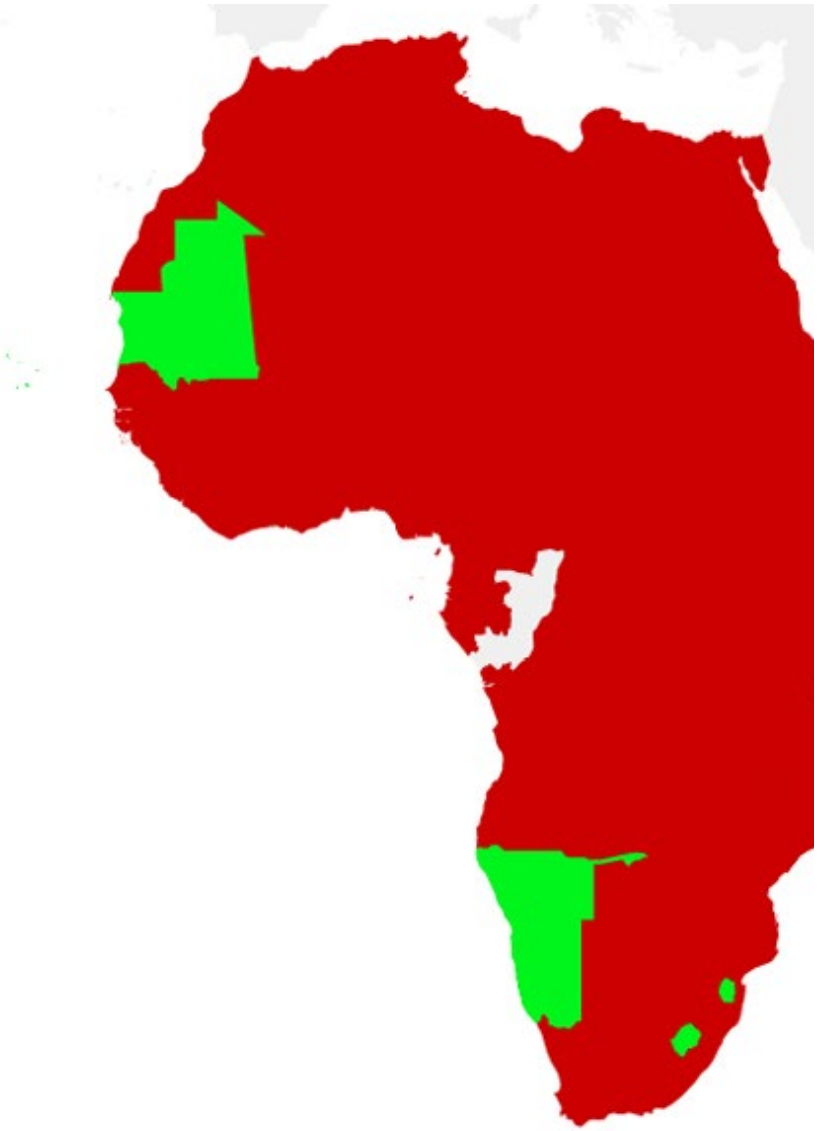

Figure 1: SIM registration in Africa — Red denotes countries where registration is do not require SIM registration as of February 2014

The first is security. As Jentzsch [8] notes, in East Africa, for example, the East African Communications Organization (EACO) has been a major proponent of SIM registration, encouraging national governments in the region to adopt relevant laws and regulations or to support voluntary initiatives. Governments and regional organizations like the EACO are ostensibly motivated by the belief that forcing customers to register SIM cards will reduce the opportunities for malevolent actors to use mobile devices anonymously to undertake unlawful or socially harmful activities, including kidnapping, drug trafficking, and terrorism. The underlying concern is that, in markets in which SIM cards need not be registered with personally identifiable information, users have the opportunity to communicate without attribution and are thus outside the immediate reach of the police. In countries like Kenya (Crandall, 2013) and Tanzania (Mwachang'a, 2013), the motivation has been explicitly linked to worries about inflammatory 'hate speech' being spread via SMS. In light of the September 2013 attack on the Westgate mall in Nairobi, the government has significantly increased its pressure, including criminal liability for MNO executives in the event of unregistered SIM cards on their network (Kamau, 2013).

The evidence for this justification, however, is weak. As Jentzsch notes, "there are essentially no robust empirical studies that show that such measures make a difference in terms of crime detection as criminals have a number of ways of circumventing rules" [9]. Where the effectiveness of SIM

registration has been studied and subject to consultation, it has often been found to be wanting. A survey of OECD member countries found little reason to believe criminals would be affected, Canada's privacy commissioner repudiated the idea after investigation, and it was rejected after consultations in the Czech Republic, Greece, Ireland, the Netherlands, and Poland (Hemeson, 2012).

Even if anonymous SIMs are difficult to obtain, as Izougu (2010) notes, criminals are likely to adopt one of three tactics: illicit cloning of third–party SIMs, using foreign SIMs on roaming mode, or the adoption of Internet and satellite telephony. Anecdotes, often relayed by the regulators who promote the registration policies, suggest the registration of SIM cards has proven helpful in some successful police investigations; yet, in other cases, the implementation has been so problematic that investigators do not trust the system (Smillie, 2012). In Africa, there are further reasons to doubt the effectiveness of SIM registration for accurately apprehending criminals. The policies assume that SIM cards are reducible to one user, but to overcome material constraints, shared usage is common on the continent (Burrell, 2010). Further upsetting this assumption that registration data will accurately reflect the future user of a SIM card is the fact that, in some cases, the difficulty of registration has induced the government to allow proxies to register SIM cards (Adaramola, 2011b). As has been noted from Tanzania to Ghana and Nigeria, the on–the–ground implementation is often weak, meaning loopholes and exceptions abound, as well. Still, security continues to dominate political debate in most African states on the need for these identification measures.

Other stated reasons for the growth of SIM registration are economic and regulatory. The International Telecommunication Union in 2007 recommended SIM registration to improve statistical accuracy on the mobile market as well as to reduce access to grey market phones (*TeleGeography*, 2013). Mobile operators stand to benefit from government–mandated policies, even if there may be upfront costs associated with registering users. The introduction of SIM registration rules may increase switching costs and thereby reduce 'churn', the industry term for customer migration to competitors [10]. This is because registration requirements are often burdensome and force customers to take time to visit registration centers to provide documentation and submit their personal information. It may impact on the common practice of swapping SIMs to benefit from cheaper in–network rates, as customers may be unwilling to register several SIMs with different network providers. Similarly, it is likely that SIM registration will impede the popular practice of "plastic roaming", meaning the purchase of a local SIM when traveling internationally [11]. Providers may also use registration data to market new services and products to customers (Sunday, 2011), given that it enables "operators to have a predictable profile about the users of their network" [12].

On the other hand, in some cases SIM registration has been supported by advocates of number portability. This could contradict the churn–reduction argument. Depending on how the system is implemented, SIM registration could empower customers to port their mobile phone numbers to other service providers as it would be easier to authenticate the customer who is requesting the transfer. Identity information would likely need to be shared between service providers, potentially through a government intermediary. In Nigeria, for example, the Communications Commission has stated that registration is a prerequisite for number portability.

Given the lack of evidence about the efficacy of SIM registration either for security or commerce, the spread of the phenomena suggests elements of what DiMaggio and Powell (1983) call "institutional isomorphism". Instead of organizational homogenization occurring due to the demands of, say, market competition, many models and behaviors spread and are copied due to ambiguity: "when the environment creates ... uncertainty, organizations may model themselves on other organizations." In the case of SIM registration, although states have little evidence of the advantages, transformations wrought by the growth of largely anonymous mobile communication create a situation of unpredictability where imitation and mimicry is likely to occur. Indeed, the head of Rwanda's Utilities Regulatory Authority has explicitly pointed to the international normalization of SIM registration as justification for his effort (see Kanyesigye, 2013a). Furthermore, because few stakeholders have challenged these policy proposals, governments have not needed to supply evidence in their favor.

V. Emerging effects

The earliest African SIM registration laws were introduced in 2006 and most have only gone into effect in the past couple years (Jentzsch, 2012), yet a number of emerging trends are evident and are likely to grow in the coming years. In this section, we point to three in particular. First, we document the variety of forms of resistance to SIM registration laws. Entities ranging from corporations to churches to everyday citizens have mobilized a variety of arguments and tactics against SIM registration, but to little formal avail. Second, we discuss the evidence that SIM registration requirements erect a barrier to mobile communications, thereby threatening the inclusiveness of African mobile connectivity. Finally, we explore the complex relationship between SIM registration and financial inclusion, especially in light of the adoption of mobile money services across the continent.

A) Challenges & resistance

Few African states face a strong countervailing power. There are multiple reasons for this, but in general limited democratization, poverty, and dispersed, rural populations have curbed the emergence of disputes in civil society. However, that is not to say that resistance is nonexistent. SIM registration policies have faced resistance in Africa, but without overturning or radically altering them, as we document below.

Scholars of surveillance have variously explored the subjectivities of resistance to surveillance (Foucault, 1979), the sometimes ad hoc and everyday character of resistance tactics (Gilliom, 2001), and technologies and techniques for opposing surveillance (Mann, *et al.*, 2003). Of particular interest is Gilliom's research, which depicts a "widespread pattern of complaint, evasion and resistance" to welfare surveillance in poor regions of the U.S. [13]. By his account, even seemingly powerless actors can undermine a surveillance mission, often without intending to resist surveillance per se. Importantly, he moves away from the dichotomies that define much of the literature (*i.e.*, the resistance relationships between watchers and the watched) to distinguish resistors other than the subjects of surveillance.

Following Martin, *et al.* (2009), who expand on this multi–actor framework for exploring forms of resistance to surveillance, we understand resistance as a multiple concept incorporating varying notions of action, interaction, opposition, awareness, and power. Resistance may be organized or not; it may be overt or covert. It can be an individual, collective, or institutional effort. Resistance is usually intentional but it can also be unintentional; that is, some acts of resistance may be unintended as resistance by the actor but nonetheless considered as such by an authority (this is what Hollander and Einwohner (2004) call "unwitting" resistance). To illustrate, the purchase of a SIM card registered under a false name may not be intended as an act of resistance by the buyer (who is simply motivated by convenient mobile access) but regulatory agencies may interpret these actions as resistant. In some cases, everyday resistance will be understood and meant as resistance by parties; in others, it will be an apolitical tactic to route around heavy–handed uniform laws that cannot capture the diversity of the world and thus require informal practices. In this sense, resistance is very often in the eye of the beholder.

Commercial resistance

Mobile network operators (MNOs) who fear losing customers and assuming the costs of registration have resisted SIM registration policies. For example, the South African legislation that, among other provisions required SIM registration, made operators responsible for the cost of compliance, an obligation that was "vigorously opposed" during consultations (Bawa, 2006). The CEO of Vodacom, Alan Knott–Craig, argued that SIM registration would "wreak havoc on SA's poor" because "millions of South Africans simply do not have the information RICA [Regulation of Interception of Communications and Provision of Communication Related Information Act] requires" (Knott–Craig, 2006). While operators argued that public safety is the responsibility of the state (that their existing tax dollars support), the government was of the position that the operators "are in possession of a very productive and lucrative resource and that it is therefore appropriate in the circumstances that they should bear particular obligations in respect of the implementation" (Bawa, 2006). In all, the top three operators reported spending around US$120 million to authenticate subscribers (Pressly, 2011), a price that was likely passed onto consumers (Bawa, 2006). In 2013, as a similar process occurred in Nigeria, some operators clashed with the government over the

looming deadline, even threatening not to terminate unregistered SIM cards as the law requires (Anonymous, 2013).

Another form of commercial resistance is embodied by the illicit sale of SIM cards that are pre–registered with the identifying information of someone other than the actual buyer. In Nigeria, for example, vendors are known to sell cards with fictitious names in order to facilitate quick and easy transactions, as customers do not have to wait for a SIM to be registered before using it. Recent reports show that some of these vendors have been arrested for contravening the country's SIM registration directive. And it is not just street vendors who are being punished. In June 2011, Globacom (a large Nigerian mobile operator) was sanctioned for selling pre–activated SIM cards (Akanbi, 2012). Regarding the operators' culpability in the sale of falsely registered SIM cards, a representative from the Nigerian Communications Commission (NCC), the national regulator, has been quoted as stating, "the vendors arrested will lead us to the dealers, and the dealers are bound to lead us to the operators that give them support. We will surely catch up with them" (Akanbi, 2012). In rhetoric reminiscent of the "War on Drugs", this crackdown has even been described as an effort "to rid the streets of pre–registered SIM cards" (Fripp, 2012a) [14]. Elsewhere, in Uganda unregistered SIMs have reportedly remained connected despite the deadline for registration passing (Kagolo, 2014).

Although operators have been perhaps the most vocal opponents, some industry actors are starting to shift to various degrees of support for SIM registration. In part, this is because governments have proven unwilling to reconsider the trend (apart from issues on the margin such as the timeline for implementation — deadline extensions are a commonplace). Others, such as the President of the Association of Telecommunications Companies of Nigeria, Dr. Emmanuel Ekuwem, share the government's security concerns (Oruame, n.d.). But a more durable trend, discussed further below, is the increasing awareness that SIM registration may prove profitable, by allowing MNOs to better target services to, and sell data about, personally identifiable customers (see Levisse, *et al.*, 2008). In mid–2012, MTN Nigeria announced a "hard line"; in favor of SIM registration explicitly referencing their ability to better target customers (Fripp, 2012b). In Kenya, the operators are reportedly using SIM registration as a means to "gain useful insight on prepaid customers [and] develop a more targeted approach to segments of our consumers and entice them to pick post–paid services" (Sunday, 2011). Following SIM registration, Vodacom South Africa was able to increase "implementations of direct prepaid campaigns resulting in significant prepaid churn reduction from 48.1% at Q3 2008 to 38.1% at Q3 2009" (Scanlon, 2010). There is thus a complex organizational dynamic to this commercial resistance whereby different actors within the mobile telephony business are involved in challenging official policy while others are supportive. These seemingly contradictory stances — opposition and opportunism — point to both the internal plurality of the telecommunications industry, as well as the inherently ambiguous nature of surveillance (on the latter, see Lyon, 2007).

Political opposition

As suggested above, in contrast to OECD economies, there is limited civil society or political advocacy around the topics of privacy and surveillance in Africa. This has also been the case with SIM registration, though in a few instances the political implications of this form of growing surveillance have motivated resistance. In Uganda, the leader of the opposition Democratic Party has argued that SIM registration is not effective at curbing crime but did provide an unwarranted increase in the monitoring capacity of the government (Anonymous, 2012a). Additionally, the Human Rights Network for Journalists in Uganda has spoken out against the process and even sued, claiming that disconnecting mobile phones violates "fundamental human rights like freedom of expression, right to privacy and access to information." (Anite, 2013; Agaba, 2012; HRNJU, 2013). In Botswana, some within the media condemned the SIM registration mandate as an effort to put journalists under surveillance (Oruame, n.d.). In Zambia, local chiefs have called for an extension of the registration deadline and the former vice–president and current opposition figure Godfrey Miyanda has spoken against "the abrogation of some citizens' liberties", calling for the requirement to be dropped (Adamu, 2013).

Consumer advocacy

On a related track, some actors have resisted SIM registration as an unwarranted imposition on consumer rights. MNO opposition has often taken this tact, but so have independent organizations. In Ghana, a think

tank and independent lawyers challenged the government's right to disconnect unregistered mobile subscribers on the grounds that it violated a valid contract between the users and the MNOs. Furthermore, because the state failed to provide the necessary identity documents to many customers who would be disconnected through the enforcement of SIM registration rules, they advocated that the requirement was a capricious and irresponsible use of government force (Dowuona, 2011). In Nigeria, consumers have complained about SIM registration, in this case because they were being charged to do so, apparently illicitly by agents, leading the MNOs to struggle to curtail the practice (Adaramola, 2011a).

Religious opposition

Perhaps surprisingly, another source of resistance has been from religious communities [15]. Throughout Africa, evangelical churches have grown to be a major social and cultural phenomenon, and one that has increasing political implications (see Ranger, 2008). In Zambia, members of the Greater Destiny Pentecostal Church have dissented, linking SIM registration to apocryphal warnings in the Bible's Book of Revelation about the "mark of the beast" (Anonymous, 2012b). Anthropologist Charles Piot (2012) reports similar resistance and "deep suspicions" in Lomé, Togo during the summer of 2012.

Everyday resistance

The most widespread resistance to SIM registration, though, has taken the form of illicit access to pre–registered SIM cards. As with other illegal activities, it is difficult to ascertain the prevalence of this practice, but according to reports and the experiences of the authors, obtaining a SIM card without undergoing proper registration is both easy and common. In South Africa, following the imposition of mandatory registration in mid–2011, SIM cards have been readily available for US$2 or US$3 in major cities. Individuals may register up to 100 SIM cards, so peers often register for each other (especially in the case of illegal immigrants who would otherwise be cut off from mobile communication (Nyathi, 2011)). In one case, an individual was found in possession of 60,000 SIM cards "all registered to one untraceable person", suggesting the involvement of MNO insiders and criminal syndicates (Nair, 2011). Although SIM registration data has been used in some criminal cases, other investigators and police officials feel that the registration fraud is common enough to undermine confidence in using any of the data for investigations (Smillie, 2012). Media reports from across Africa are peppered with stories of the ease with which pre–registered cards can be purchased. It is likely often the result of activities such as those uncovered in Nigeria, where telecommunications managers were discovered making pre–registered SIM cards on machines seized in a raid (Onyekamuo, 2013). In addition to knowingly resisting the law, there have been examples of Hollander and Einwohner's (2004) 'unwitting' resistance. Commenting on the "illegal" sale of pre–registered SIM cards, the NCC's Director of Public Affairs has stated that, "some people are doing it out of ignorance but that won't stop us from prosecuting those caught violating the law" (Akanbi, 2012), thus implying that resistance can be "ignorant" — that is, unwitting but still punishable.

Material resistance

Key challenges have also emerged from the very materiality of implementing SIM registration. The creation of an information infrastructure requires interaction between manifold sources of data: in this case, identity documents, registration forms, SIM cards, computer databases and more. This results in what Edwards (2010) calls "data friction", the inevitable conflicts and unruliness of working with data. A similar dynamic is present in building a surveillance infrastructure like SIM registration.

In Zambia (Awad, 2013) and South Sudan (Nashion, 2013) the registrars ran out of the necessary paperwork. Elsewhere, poor transportation infrastructure has hampered efforts (*Lusaka Voice*, 2013). In Uganda, manual data entry slowed progress (Waiswa, 2013).

A key challenge to the registration of mobile users in Africa is the lack of reliable identification documents. This is a form of material resistance that especially manifests given the sheer scale of the registration requirements [16]. In most countries, the foundational civil registration of vital statistics (such as birth and death records) is undeveloped, meaning many people live "without leaving a trace in any legal record or official statistics" (Setel, *et al.*, 2007; see also Breckenridge and Szreter, 2012). Even in situations where population registries are established, tens of millions of Africans lack the documentation that links them to their "data double" (Haggerty and

Ericson, 2000), thus limiting their ability to reliably prove their identity. In the case of South Africa, among the most well–established and capable African states (Goldblatt, *et al.*, 2008), this situation has persisted despite a legacy of mandatory identification documents — apartheid's infamous 'passbooks' — and a significant post–apartheid effort to improve and unify civil identification (Breckenridge, 2005). A recent Gallup survey in Kenya on barriers to voting found that lack of documentation was a significant barrier (Tortora and Rheault, 2012). In Ghana, where identity documents are often handwritten, mobile telecommunications service providers have blamed the country's weak national identification infrastructure for the failing national initiative to register SIM cards (Dowuona, 2012). Likewise, in Uganda the lack of a national identity system is one of the official reasons for declining SIM registration rates (Nantaba, 2012; see also Kalungi, 2013).

The situation is aggravated for the elderly and infirm, and by the high proportion of Africans who live in sparsely populated rural areas. Not only are these populations less likely to have access to the government offices where they could acquire identification documents, they are less likely to know about or be able to travel for SIM registration. The costs of long distance travel are an additional factor complicating SIM registration for those living in remote areas. Minors, too, often lack the requisite documentation, leading one Rwandan observer to note that "minors who own phones without their parents' or guardians' consent will effectively be disconnected" (Kanyesigye, 2013b). Even when citizens are able to access and negotiate government bureaucracies, the cost of providing a photograph or photocopies for registration can prove exclusionary [17].

B) Barrier to mobile diffusion

The diffusion of mobile phones in Africa has been widely lauded for its developmental role, oftentimes providing a transformative form of communication. This widespread diffusion has been enabled by a significant reduction in the barriers to entry for customers, such as through business models like prepaid mobile telephony. Where many governments have previously taken significant steps to support universal mobile access (*e.g.*, through industry subsidies and tax allowances), SIM registration represents a shift toward erecting barriers to access, especially for poor and marginalized populations. As the Head of Regulatory Affairs for Africa at Millicom International Cellular noted, "These requirements present real 'access' difficulties for the most economically vulnerable individuals" (Kamara, 2013).

In addition to the evidence presented above that many Africans lack the necessary documents for SIM registration, Jenztsch (2012) has recently provided an economic model that demonstrates the likely slowdown in mobile penetration growth. The thesis is borne out by data from countries that have implemented mandatory SIM registration measures, leading one industry insider to say that "all SIM cards registration exercises in African countries have translated into a temporary decrease in the number of mobile subscribers" (Southwood, 2011). In Zimbabwe, the two leading operators lost more than two million subscribers from a previous total of 4.4 million, dropping mobile penetration 14 percent, to 53.5 percent of Zimbabweans (Southwood, 2011). In South Africa, MTN's subscriber base fell from 17.2 to 16.4 million following SIM registration, and the policy was "expected to slow down subscriber acquisition by operators as the vast majority of the population either does not have formal identification or proof of address" (Esselaar, *et al.*, 2010). MTN's competitor Cell C also reported a 70 percent drop in gross activations as a result (de Koker, 2010). In November 2013, Niger deactivated a third of its mobile phone connections due to lack of registration (AFP, 2013). In Uganda, where a registration exercise was scheduled to end in August 2013, MNOs have expressed concerns about losing customers as it is common for people to use multiple SIM cards to take advantage of cheaper in–network calls, but for whom registering several SIM cards with different operators will be a burden (Kulabako, 2012). The founding assumption of registering a SIM card to one person does not reflect the dynamic of shared access which characterizes African mobile use (Burrell, 2010) [18]. Mobile subscriber figures are notoriously difficult to count accurately (Sutherland, 2009), so while some of the reductions can be expected as the result of removing unused accounts, in other cases, the increased barriers — especially for those without identity documents — likely serve to reduce access to low–cost mobile communication [19].

In practice, this exclusionary aspect is probably unevenly distributed with regard to socio–economic status, with those already marginalized to be most affected [20]. For example, in South Africa, de Koker [21] noted that

SIM registration would disproportionality impact undocumented migrants, asylum seekers, and even documented refugees (whose documentation may not suffice). As one Zimbabwean MNO noted, its customers traveling to South Africa are being forced to rely on roaming "as non–residents are finding it difficult to get SIM cards" (Analysys Mason, 2010). Many South African citizens, too, struggle to obtain official documentation, and as of February 2010, more than 500,000 identity documents were unclaimed from government offices. For many criminals that SIM registration mandates seek to impede, it is unlikely that access to fraudulent identity documents is a problem. Overcoming such unintended discriminatory aspects of SIM registration would require a significant investment in outreach that is largely missing (spare isolated cases like Rwanda's "door–to–door" registration drive (Kwihangana, 2013)); instead, the overwhelming logic is one of responsibilization, where citizens are held accountable for meeting the goals of the state. Even worse, key coping strategies of the poor — such as using multiple SIM cards — are being villainized (*e.g.*, *Nigeria Communications Week*, 2013).

C) Linkages to the financial inclusion agenda

The rise of mobile identification in Africa is quickly being linked to another influential trend: the financial inclusion agenda, though perhaps in contradictory ways. Development institutions, philanthropic organizations, governments, and industry have joined together in an effort to increase access for poor people to financial services, pointing to evidence of various developmental benefits (Schwittay, 2011). In the past five years, MNOs have joined the movement in significant numbers, spurred by the success of M–PESA (see Maurer, 2012; Donovan, 2012). Without discounting the charitable impulse present in much of the mobile financial inclusion agenda, for network operators, the appeal is largely commercial: as competition increases and customer acquisition slows, operators see mobile money as an important emerging revenue stream. For example, Airtel has recently announced a partnership with Sanlam, a South African insurance firm, to sell policies in seven African countries, and Safaricom has partnered with banks to offer micro–loans, insurance, and savings to the more than 15 million users of M–PESA (Munshi, 2012).

As with other financial services, guidelines from the Financial Action Task Force (FATF) for mobile money endorse customer due diligence rules for the purposes of anti–money laundering and combating the financing of terrorism (AML/CFT). These rules, commonly referred to as Know Your Customer (KYC) regulations, push mobile money providers to collect identity information from their customers, however the limited identification documentation readily available to the poor has traditionally been one of the key barriers to accessing formal financial services. Modifications to the FATF guidelines that allowed so–called 'tiered' or 'proportionate' KYC rules are considered a key reason services like M–PESA were able to succeed (see Isern and de Koker, 2009). Such standards require less personal information and are considered more appropriate for the low–risk activities of mobile money users. A number of proponents of SIM registration have argued that such a practice will benefit financial inclusion by universalizing the type of KYC data needed for mobile money; for example, a representative of the Tanzania Communications Regulatory Authority "said that [the] SIM card registration exercise is for the benefit of customers especially for services like electronic money transfers, the settling of bills and other monetary transactions" (Mhagama, 2013). The reality, though, is more complicated. As de Koker (2010) discusses for South Africa, the information required for SIM registration and KYC differ, and it is unclear how well they can be aligned. In cases where SIM registration is excluding the poor from mobile services, it may even undermine financial inclusion goals (see also de Koker and Jentzsch, 2013; de Koker, 2011).

In other cases, including those where the KYC and SIM registration efforts align, the identification of mobile users could increase the use of formal financial services. Importantly, the success of new mobile financial services is believed to hinge on new forms of data collection and analysis. The vast majority of Africans lacks a formal credit history, meaning that potential lenders are unable to model and manage risk. The canonical microfinance model used group lending and joint liability in part because it overcame this lack of credit records, relying on existing trust and social capital to ensure repayment (Roodman, 2011). As microfinance evolves towards more individualized and commercial models, including new products such as insurance, "more mainstream financial tools such as credit bureaus and credit scoring are already starting to be used" (Schwittay, 2011; see also Schreiner, 2009; Campion and Valenzuela, 2002). As a recent industry report detailed, "there is an opportunity for lenders to chart another path,

using increased computing power and new sources of information and data (including mobile phone usage patterns, utility bill payment history, and others) to build better risk models" (Baer, *et al.*, 2012). While in some cases this data will be population–level, in many it will be tied directly to individual identity, often through the use of SIM card registration data. For example, one Asian consumer lender "found that delinquencies on mobile phone bills were 60 percent more predictive of eventual small–loan defaults than were delinquencies on loans from other banks. Even the choice of payment plan for the phone bill, a seemingly unimportant variable, was found to be just as predictive as the second–best variable available from the credit bureau" (Baer, *et al.*, 2012).

Although it is too early to tell the result of this, there are a number of causes for concern. As Gates (2010) points out in the U.S. context, conceptualizing identity as a "disembodied aggregate of transaction–generated data ... with financial data (and the security of that data) at its core, is a fundamental aspect of the reorganization of the U.S. economy around the priorities of financialization". There is reason to believe that the confluence of SIM registration (which makes transaction data personally identifiable) and financial inclusion (which advocates financial services for the poor) could come, as has been the case in the U.S., to "serve the finance industry's need to define, measure, and differentiate the population in terms of its financial capacities" — so–called redlining. While this may be desirable in some cases, as Roy (2010), Manji (2010), and Bateman (2010) document, and recent microfinance industry crises in India and elsewhere attest to, there is also a darker, more worrying side to financial inclusion. As calls and support for "cashless" economies gather steam in Africa, the inevitable result will be everyday financial records that are auditable and traceable, and, doubtless, incentives to commodify personal information. Combined with the communications and location data of mobile phones, this is an unprecedented development. A recent United Nations Conference on Trade and Development (UNCTAD) (2012) report notes that in East Africa there is not legislation "that clearly defines who can get access to a mobile money trail, and how, when or under what conditions such access may be obtained" (see also Harris, *et al.*, 2013). In the African context, where limited consumer or privacy protections exist, the trend deserves critical engagement [22].

VI. Discussion: African mobile surveillance societies

Justifying his support of SIM card registration requirements, the executive secretary of the East African Communications Organisation noted that "Our telephones have become a part of our identity." This view of the centrality of mobiles to the daily lives of users is reflected in the social studies of mobile communications and is an important reminder of the seriousness of probing regulatory transformations such as SIM registration.

Given their relative importance in Africa (Kelly and Minges, 2012; Castells, *et al.*, 2007; Donner, *et al.*, 2010), it is perhaps not surprising that states would seek to monitor mobile communications. Yet, in considering SIM registration and resistance, it is crucial to consider it as a component of a growing surveillant assemblage that also incorporates other technologies such as biometric identity cards and electronic passport systems, new video surveillance technologies, and, especially important in the African context, electronic health systems. While doing justice to the breadth and complexity of these developments is beyond the scope of this paper, this closing discussion contends that African SIM registration requirements are part of a growing trend on the continent toward government monitoring and control of the communications infrastructures.

To emphasize the diversity of the phenomena that parallel — and sometimes explicitly intersect with — SIM registration, consider a few cases. In mid–2013, Benin became the site of a scandal around allegations of wiretapping. As Frowd (2013) summarized, the local affiliate of South African mobile operator MTN was accused of permitting the president of Benin to wiretap his political rivals from the isolation of his office and home. A few months prior, researchers at the University of Toronto revealed the presence of command and control servers for an offensive digital intrusion software called FinSpy in Ethiopia, Nigeria, and South Africa (Marquis–Boire, *et al.*, 2013). This software, provided by British firm Gamma International, has been used from Malaysia to Bahrain to infiltrate opposition communications [23]. In each case, a population registry from SIM cards would significantly lower the barriers to identifying

communications.

In Kenya, the government has established the so–called Integrated Population Registration System (IPRS) which merges "data from the birth and death register, citizenship register, ID card register, aliens register, passport register and the marriage and divorce register ... On top of these 6 registers, it compiles details from the elections register, tax register, drivers register, National Social Security Fund (NSSF) register, National Hospital Insurance Fund (NHIF) register and the Kenya National Bureau of Statistics (KNBS) register." As Mbote (2013) reports, the "SIM registration exercise would not have been possible without the IPRS." The amount of information in the IPRS led its chief to brag that, "We now have the 360 degree view of any citizen above the age of 18 years."

Countries have also taken to monitoring and filtering mobile communications content. SIM registration in Zimbabwe is being pursued at least in part as a means to clamp down on political speech (*e.g.*, ZimDiaspora, 2013). Zambia is using deep packet inspection (see Bendrath and Mueller, 2011) to block opposition media (Tor Project, 2013). An effort by the Malawi Communications Regulatory Authority to capture communications metadata (and potentially content) was rejected by a court in September 2012 (Gondwe, 2012). In Kenya during the lead up to the 2013 elections, MNOs were algorithmically blocking up to 300,000 SMS per day (Mukinda, 2013).

In an increasing number of African countries, these practices are being outsourced internationally. Uganda has inked a deal with the Korean Internet and Security Agency to help manage its domestic Internet (Businge, 2013). Zambia, Ethiopia, and Zimbabwe have sought Chinese assistance in monitoring domestic communications and the Chinese telecommunications giant Huawei has moved from simply providing infrastructure to actively managing communications networks in Africa (Reed, 2013). Pierskalla and Hollenbach [24] suggest that the capacity for mobile surveillance in Africa is low, however these dynamics suggest that even if that is the case, it is rapidly changing. Finally, Nigeria is currently in the process of awarding 25 contracts for mobile phone surveillance projects (Akwaja, 2013) despite concerns about the lack of judicial oversight, legislative buy–in, and rogue access to collected data (Collins, 2013).

Although surveillance is constitutive of modernity (Lyon, 2007) and sometimes even desirable, the manner in which SIM registration mandates and these related developments have been implemented is troublesome. In brief, they have been pursued without appropriate consultation, transparency, or ameliorative reforms such as fair information or privacy laws. In fact, in cases from Kenya and Tanzania to Nigeria, the very legal basis for the action is in question. Mobile communications surveillance has been tied to other pernicious problems, particularly corruption due to both the secrecy and substantial government contracts involved. Nigeria provided a US$40 million sole source contract to an Israeli firm for monitoring communications (Emmanuel, 2013) and a recent Kenyan tender for surveillance equipment was cancelled amid improprieties (Wabala, 2013).

This is exacerbated by the low level of democratic development in Africa. According to Freedom House (2012), only 10 countries qualify as free, and one of those — Mali — was the site of a recent coup. Whitehouse (2012) notes that, "the number of electoral democracies on the continent has fallen from 24 to 19 in the last seven years." Indeed, non–democratic African countries have proved quite adept at subverting any potential liberatory effects of ICT (*cf.*, Diamond and Plattner, 2012). Ethiopia has maintained a government monopoly on telecommunications and invested significantly in controlled networks (Gagliardone, 2009); Swaziland's absolute monarch is a large shareholder in the monopoly mobile operator MTN, which also has his daughter on the board of directors (Lukhele, 2012) and has been accused of shutting down its network to impede political protests (Langeni, 2011). More broadly, mobile communications are a far more controlled infrastructure than the Internet (Benkler, 2010; Zuckerman, 2010). The addition of SIM registration requirements serves to lower the barrier to surveillance. The resulting chilling effects arise just as many are hoping that mobiles can be used to promote democracy on the continent.

As of 1999, no country in Africa had data privacy legislation (Banisar, 1999). In the intervening years, around 10 have enacted some form of data privacy law, and a number of others have such rules pending, but implementation and enforcement capacity remains limited (Makulilo, 2012). In particular, few African countries have corresponding legal duties on the

collectors of personally identifiable information, such as not to make unauthorized disclosures. The secondary use of personally identifiable data is sure to grow, consolidating and linking to other emerging databases. Importantly, this is happening across borders, with the East African Community taking steps to share SIM registration across borders (Sato, 2013). Already, the CTO of MTN Nigeria is publicly advocating for SIM registration data to link to banking, health, and driving license data (Atili, 2012). It may be the case that normatively desirable outcomes emerge from these happenings — indeed, we agree that the exclusion of the poor from identity systems is often problematic (Setel, *et al.*, 2007) — but the growing chorus of support for the positive aspects must be complemented by steps to avoid the downsides; in the case of SIM card registration in Africa, this has rarely happened. As suggested earlier in this paper (section II), the exclusion of surveillance from the dominant literature on the impact of mobiles in Africa is at least partly responsible for this silence and inattention.

There is an urgent need for enhanced scholarly and activist attention to SIM registration and associated trends that are establishing surveillance at the heart of the African mobile society. Too often, privacy is conceived as a technical problem to be fixed — an afterthought — rather than a complex political problem. Already the World Bank is thinking about "using digital identity to fight poverty" (Sudan, 2013) and the United Nations is pioneering "big data for development" (United Nations Global Pulse, 2012). More attention must be directed towards the privacy implications and politics of these trends. This attention can draw on international experience, but must be deeply aware of the particularities of the African context. For example, there is scope for learning from European data protection work, restrictions on secondary use, and fair information laws [25]. Already SIM registration data is being used for inappropriate ends such as electioneering (*e.g.*, *Zambian Watchdog*, 2013) and worries about identity theft are emerging (Onwuegbuchi and Ugwu, 2013). However, the specifics of African political and economic development matter, and future work should draw on this history and context. By way of illustration, the outsourcing of network monitoring to foreigners mentioned above is directly a result of limited bureaucratic and technical acumen, and the impotence of the resistance to SIM registration can be attributed to the political arrangements in many African countries where civil society and opposition is weak. Scholars studying digital technologies would do well to connect with Africanists.

VII. Conclusion

While many popular and academic narratives on the impact of mobile telephony on Africa's development depict a positive outlook in which technology will bring sustained benefits to citizens as connectivity increases, parallel developments complicate these storylines. As we have shown, SIM registration represents a form of communications surveillance that reduces the anonymity once afforded — perhaps unintentionally — by prepaid airtime. These identification mandates may bring modest security benefits, although as noted, the evidence for such claims remains inconclusive. More importantly for the present discussion, however, is that SIM registration complicates the much–lauded developmental and emancipatory influences of these technologies. Of course, this pessimistic view ignores the resistance dynamics that were the focus of this article. In the case of SIM registration, it seems formal resistance to the imposition of the laws has been modest and ineffectual, but more everyday forms of resistance to compliance are proliferating. And, of course, these technologies never perform as seamlessly or perfectly as their proponents claim (*cf.*, Magnet, 2011). At the very least, more debate is needed about these policies, including their political origins, effectiveness, and unintended consequences. We hope this paper has made a small contribution to these debates.

On the topic of future research, there is a lot of exciting work to do. We have ambitions to conduct deeper case studies of these programs across several countries on the continent. This will involve a closer engagement with stakeholders as well as an ethnographic examination of the everyday life of SIM registration, including documenting in detail what actually transpires at the point of enrolment (*e.g.*, how discretionary are requirements in practice, what role does local knowledge play during registration when, for example, the enrollee is already known by the

enrolment agent, and so forth), as well as post–registration realities. In addition, future research ought to explore more how African SIM registration policies conflict with other policy initiatives. As we have suggested above, it is already linked to the financial inclusion agenda, but other areas remain unassessed. For example, in Mexico the VidaNET program, which provides a treatment reminder system to those with HIV, has faced challenges as a result of the country's SIM registration laws. Patients are understandably wary about participating in these mobile health programs because they fear medical confidentiality may be jeopardized by unrelated identity registration requirements (Feder, 2010). A separate regulatory development that deserves further study is the crackdown on counterfeit mobile devices, as is currently taking place in Kenya. This anti–counterfeit phone initiative led by the Communications Commission of Kenya and executed by MNOs aims to disconnect handsets with unrecognized IMEI numbers, which are believed to be fake (wa Chebusiri, 2012) [26]. This disconnection strategy has been linked with the country's SIM registration efforts even though it is not immediately obvious how the two relate (that is, counterfeit phones seem to represent more of a trade regulation matter than a security problem). Finally, there is significant room for academics and civil society to work with government on the challenges raised in this paper for consumer protection laws, data protection laws, and constitutional safeguards. Best practice guidance with regard to SIM registration and network disconnection would also serve policy–makers.

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Notes

1. Within the community, disagreements about its focus and purpose exist, including whether or not information and communication technology and development (ICTD) is a more accurate term. For a discussion, see Donner (2011).

2. Lyon, 2002, p. 2.

3. Poster, 1990, p. 3.

4. As with any method, ours has particular strengths and weaknesses. This broad and sustained effort to survey the African continent uncovered a host of emerging effects of SIM registration that have not previously been systematized, though this necessarily limits the contextual understanding that would emerge from fieldwork on the ground. In future, we hope to complement this paper through case studies of regulatory processes and actual policy enforcement.

5. An IMSI (International Mobile Subscriber Identity) is a unique identifier used in GSM, UTMS, and LTE networks. This information is stored on a mobile device's SIM (Subscriber Identity Module) card and comprises a three–digit Mobile Country Code (MCC), a two–three digit Mobile Network Code (MNC), and a one–10 digit Mobile Subscriber Identification Number (MSIN). At its most basic, an IMSI catcher is a technology that pretends to be a cell site and is used to collect IMSI numbers from mobile devices (including mobile phones and SIM–enabled tablets and other devices) within a specific geographic area. It is used to intercept and analyze communications between phones and the mobile network, and is normally undetectable by mobile users. It has been reported in at least Ghana (GhanaWeb, 2005) and sought by Liberian authorities, though U.N. regulations may not permit it (FrontPageAfrica, 2013).

6. Given the CDMA standard does not use removable SIM cards, this survey is of course limited to the dominant GSM standard.

7. These data were compiled from various sources, including research conducted by MobileActive (an advocacy group), Steve Song of Village Telco, Jentzsch's (2012) work on the economic implications of mandatory SIM registration, and the authors' own data collection efforts. As of February 2014, only Cape Verde, Lesotho, Mauritania, Namibia, Somalia and Swaziland had not introduced a policy for SIM registration.

8. Jentzsch, 2012, pp. 610–611.

9. Jentzsch, 2012, p. 612; see also GSMA, 2012.

10. Jentzsch, 2012, p. 617.

11. Analysys Mason, 2010, pp. 41–42.

12. Hemeson, 2012, p. 4.

13. Gilliom, 2001, p. 112.

14. Indeed, much of the discourse surrounding SIM registration is militaristic. In (post–conflict) Liberia, the local MNO has referred to SIM registration agents as "foot soldiers" (Genoway, 2012). In Uganda, the ICT Ministry has propagated the oft–debunked (Solove, 2011) but durable myth that "the only person who should be afraid of SIM registration, naturally, is the criminally–minded" (Uganda. Ministry of Information and Communications Technology, 2012).

15. Though, see Lyon, 2002, pp. 85–86, for a reflection on this topic.

16. As the head of Vodacom South Africa noted, "Vodacom alone will have to register 9,000 customers every single hour for a full year" in order to meet the SIM registration requirements (Knott–Craig, 2006).

17. This has been noted explicitly in Uganda (Businge, 2012) and mirrors similar concerns with other mandatory registration systems in Africa. For example, the effectiveness of the South African social protection program has been continually challenged by the barriers posed through the identification requirement for the more than 10 million eligible beneficiaries. Overcoming the difficulties poor people face in accessing government channels and acquiring necessary documentation has required significant organizational and technical innovation, such as mobile registration programs, cross–departmental harmonization, and free provision of office supplies.

18. The GSMA (2013a) estimates 1.98 SIM cards per subscriber in non–BRIC developing countries, noting "SIM per subscriber patterns are influenced by cost–conscious consumers who accumulate prepaid SIM cards to cope with limited rural network coverage and to benefit from the latest and most affordable tariffs".

19. In one of the few cases where specifics are available, Telecel Zimbabwe reported that 10,000 of the 100,000 unregistered SIM cards it shut off in September 2013 had been active (Kabweza, 2013).

20. There are, of course, ways to minimize the exclusionary aspect. In the UAE, unregistered SIM cards can still receive calls and SMS, though not initiate them (Ghanim, 2013); diaspora Rwandans can register online (Mwenesi, 2013).

21. de Koker, 2010, pp. 19–20.

22. On a related note, the merger of South African biometric identity documents and financial services is discussed in Breckenridge (2005) and for Ghana in Breckenridge (2010).

23. Activists have even tracked the whereabouts of executives and sales people of surveillance technology firms on the continent, with recent evidence revealing, for example, business trips to Equatorial Guinea, Gabon, Morocco, and Uganda (WikiLeaks, 2013).

24. Pierskalla and Hollenbach, 2013, p. 221.

25. For a start, see the International Principles on the Application of Human Rights to Communications Surveillance, at https://en.necessaryandproportionate.org/text.

26. In Pakistan, when one phone was reported as stolen, it shut off thousands of other phones because the IMEI numbers had been cloned (van der Berg, 2012, p. 42).

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