

Biometric ID: Robust Enough for Development?



<http://worlduin.homestead.com/what.html>

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Overview

1. Context matters
2. Identification as development
3. The diffusion of biometric ID in poor countries
4. Robustness in a developmental context:
spoofing vs. system integrity
5. Some implications

Context Matters

Improving our ability to understand, predict and control the performance of biometric systems in operational environments will require more thorough study of the human and environmental influence variables....and more experience in estimating the systematic uncertainties introduced by...environmental and human factors encountered in the real world.

Wayman, Possolo and Mansfield 2010

Biometric Technology in Poor Countries

Migration: Refugee registration in Malaysia



http://www.unhcr.org.my/News_Views@-Fingerprints_mark_new_direction_in_refugee_registration_.aspx

Finances: ATMs in rural India



<http://india.blogs.nytimes.com/2011/09/29/banking-in-villages-via-human-a-t-m/>

Voting: ID cards in the DRC



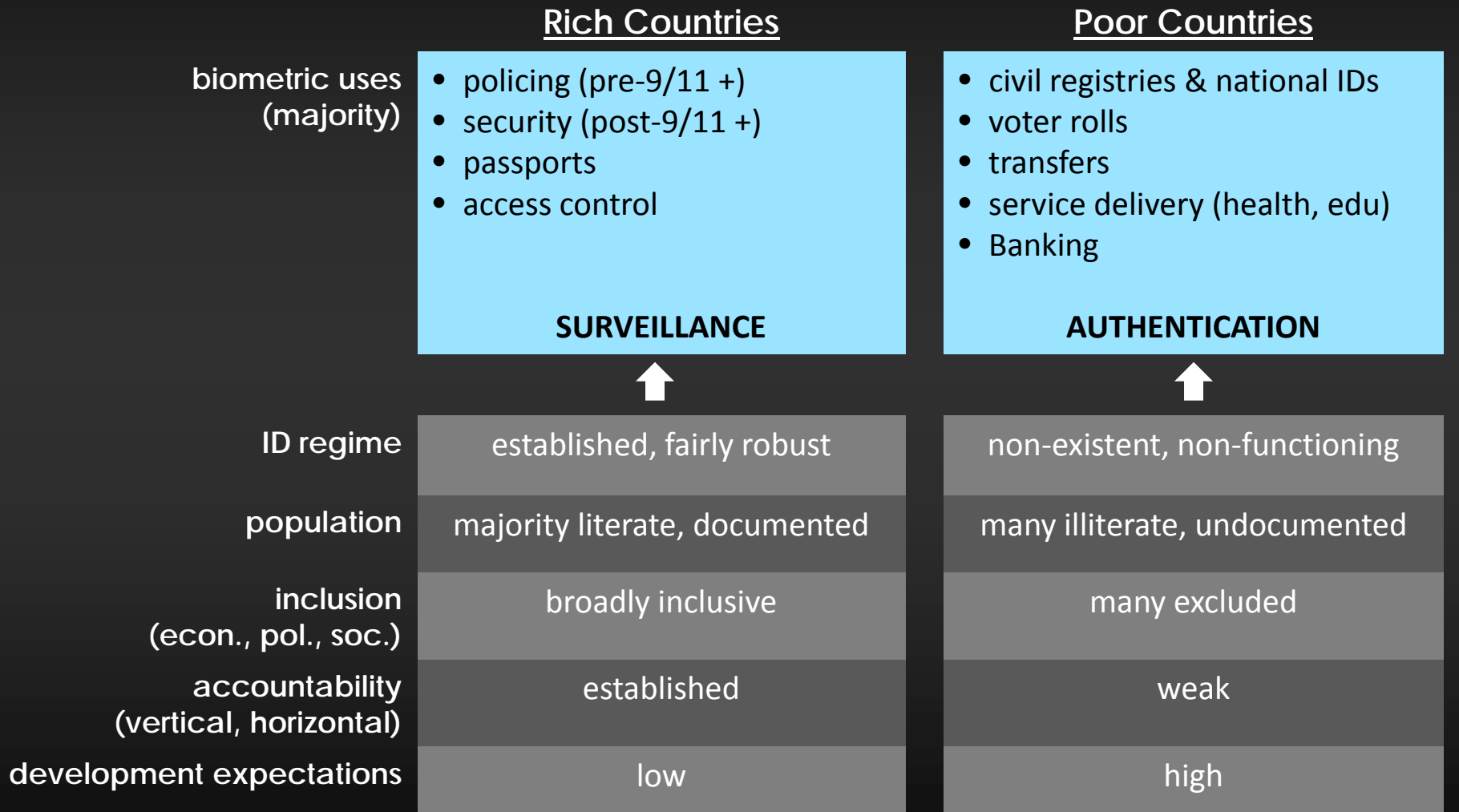
http://www.unhcr.org.my/News_Views@-Fingerprints_mark_new_direction_in_refugee_registration_.aspx

G2P: Watan relief in Pakistan



<http://4.bp.blogspot.com/-gIYHCda-y24/TpL2XzZkSdl/AAAAAAAAAUk/3UCI-ZIMBcw/s640/watan+card.jpg>

Rich and Poor: Different Contexts and Uses



Development as Exercise of ID

Development includes the processes and policies by which a nation improves the economic, political and social well-being of its people.

- Measured by a range of indicators: there are cross-country differences but broadly collinear across the global range of countries → some coherence: progress towards “modern state”
- Development distinct from human rights but some convergence in agendas → rights-based approach (OECD)

Development as Exercise of ID

Evolution of ID can be seen as part of this process from the perspective of citizens, states, donors

- Developing states are expected to do more than now-wealthy countries did 100 or 200 years ago
 - More “points of engagement” between citizens and states
- Traditional ID mechanisms have broken down in larger, more mobile, societies

“Identifiability”: necessary to access basic rights and development...

- UN declaration on human rights:
 - name
 - nationality
 - recognition before the law
 - take part in government
 - an identity with family ties
 - equal access to public services...
- More in convention on the rights of the child...

... but lagging in poor countries

Under-registration (children → adults → children)

- 48 million unregistered births (36% of total) each year (UNICEF, 2005)
- Strongly associated with poverty:
 - LDCs: 71% not registered
 - South Asia: 63%
 - Sub-Saharan Africa: 55%
 - Rich countries: 2%
 - In Dominican Republic, 40% of children in lowest income quintile not registered versus 3% in highest quintile

Statelessness: 12 million (UNHCR)

→ These people do not formally exist!

But ID alone is not enough, must have “functionality”: *development purpose*

Citizens

Right to authenticate self = precondition for other basic rights and for “equal access”

→ Lack of ID (common for poor, women, minorities, stateless) can contribute to exclusion from various spheres:

Economic	Political	Social
<ul style="list-style-type: none">• Employment• Migration• Property registrn• Financial assets	<ul style="list-style-type: none">• Voting	<ul style="list-style-type: none">• Education• Healthcare• Gender equality

- Citizens will value (demand) ID for what it offers them
- If ID is essential for rights, then cost cannot be a barrier

States

- *Right to identifiability = state responsibility*
 - Difficult in countries with low administrative reach/capacity
 - Corruption and fraud increase costs, divert resources → this curtails the rights of other citizens
- *Efficiency and development = state goal (hopefully)*
 - Strengthening tax administration and integrating information systems to reduce evasion (Argentina)
 - Accurate demographic data (e.g. health)
 - ID linked to service systems can strengthen management, cut costs and increase transparency and accountability (elections, use of public funds) while reinforcing rights (Pakistan Watan card)

Donors

Identifiability = development instrument

- Part of development programs: transfers, demobilization, disaster relief, etc.
- Trend towards use of biometrics (e.g., sophisticated electoral technology in poor countries)
- Consume for planning and evaluation: population statistics
- Where strong ID is lacking, donors provide/fund (at considerable cost)

→ Much wastage of resources on transient, single-purpose identification programs/components

Cases by Status and Region (provisional estimates!)

Stage	SSA	LAC	MENA	EAP	ECA	SAS	Total
pre-implementation	12	2	3	2	3	11	33
stalled	2	1	2	0	0	0	5
completed	1	0	0	0	0	0	1
implementing	9	9	5	2	1	3	29
in use	43	21	1	12	2	16	95
<i>Total</i>	<i>67</i>	<i>33</i>	<i>11</i>	<i>16</i>	<i>6</i>	<i>30</i>	<i>163</i>

Pre-implementation = announced, planning, procurement, piloting

Stalled = postponed, abandoned, cancelled

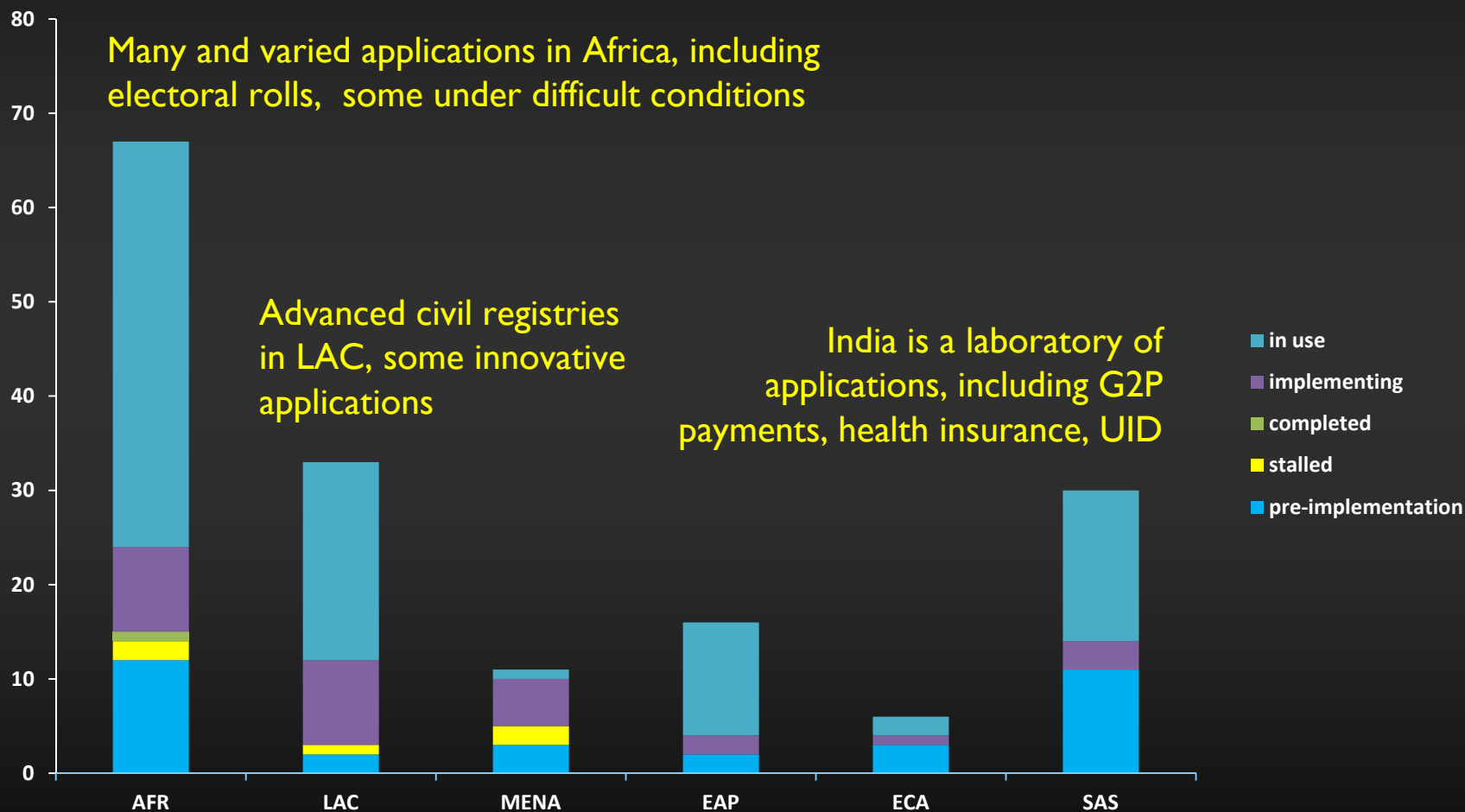
Completed = limited-run program

Implementation = registering, issuing/distributing IDs)

In use includes reforming older biometric processing and updating registries

Cases by Status and Region

(provisional estimates!)



Cases by Application Type and Region

(provisional estimates!)

“ID Driven”

- National IDs: 35 (Peru, Botswana, India)
- Civil registries (Chile, other LAC)

“Application Driven”

- Refugee and DPs - documentation and transfers: up to 20 (Afghanistan, Pakistan)
- Financial sector, including access: 14 (Ghana, Malawi)
- Poverty and social services: 45 (India, Pakistan, Kenya, DR)
- Voter registration: 31 (Bolivia, Mozambique, DRC, Bangladesh)
- Core public governance: payroll etc: 3+ (Liberia, Nigeria, Kenya)

Examples

- *Dominican Republic*: extension of CCTs to undocumented citizens
- *DRC*: Reintegration support to ex-combatants (iris-scanning, remote payment and mobile ATMs), voter roll
- *Pakistan*: Watan card for flood relief
- *Yemen*: civil service, maternal health insurance, national ID
- *India*: UID (Aadhaar) for financial access etc., RSBY health insurance program, health smartcards (paperless), 25 million households (subsidized but market-driven)

How do ID Regimes Develop?

- No unique model
- Depends on pre-existing systems
- Political factors, national champion, also culturally driven
- Evolutionary process from single-purpose to broader use, as in US (SSN) and DRC (voter card)

Country ID Trajectories

Primary		Secondary		Tertiary	Examples
Security	➔	national ID	➔	social applications	Pakistan
Admin. (HR)	➔	transfer (payroll)	➔	national ID	Liberia
Voter roll	➔	national ID	➔	social applications	Bangladesh
Unique ID number	➔	(links pre-existing applications)	➔	-	India
Multipurpose ID card	➔	everything (256 wallets.....)		-	Malaysia

“Robustness” in Development Context

A robust ID system *for development* must:

- ✓ Be inclusive:
 - Avoid unnecessary cost (e.g. proposed UK ID was ~140 times the cost/head of developing country IDs!)
 - Have provisions for failures-to-enroll (worn fingerprints)
 - Have provisions for financial sustainability
- ✓ Be perceived to have integrity (enrolment and authentication)
- ✓ Conform to social norms
 - Privacy concerns not yet prominent in most cases perhaps because traditional societies have little privacy
 - But this concern will probably increase over time

Beyond “Spoofing”

“Spoofing” remains an issue...

- South Africa social transfers: live fingerprint recognition required

...BUT perhaps less of a problem for low-value-transaction programs

- In some cases, authentication has been prioritized over de-duplication (RSBY)

System Integrity in Context

System integrity, both for enrolment and authentication, may be more critical given common contextual factors:

- Lower capacity and literacy, weak logistics
- Different social and political norms:
 - Weak enforcement of rules
 - Patronage: expect efforts to undermine rules-based systems
 - Potential collusion: operators and users
- Bureaucratic silos and reluctance to share data

How Secure is Technology?

- Some disturbing claims for offline ID technology:
 - UK: card security reported vulnerable; US concern over BELIEVE Card (Mail Online August 6, 2009; Berkeley Law February 2012)
 - Card security one reason UID chose a central database
 - But some areas not yet well covered for online authentication
- Experiments with forensic use of biometrics suggest strong influence of cognitive factors (Dror et al 2006)
- Need to test carefully before national system
 - Biometric hacker challenge?

How Precise Under Operational Conditions?

- Ranges of error unknown for many cases
 - Procedures for redress of errors often not clear
- UID cites impressive achievements:
 - FTE (biometric) 0.14%
 - FNIR 0.035%
 - FPIR 0.057% against gallery of 84 million
 - Implies very few problems in smaller countries
 - Lesson: ample data and incentives for quality control
- We need more open performance data
 - But also a sense of realism. Often no clear alternative to biometrics given limitations of civil and population registries.

Under-utilizing Biometrics is Common

1. No (or only local) de-duplication

- Data quality and logistics inadequate for 2-stage process especially under time deadline (electoral rolls Bolivia, Somali Republic; Ghana?)
- Reduces sanctions against operator collusion to extend favors or fill quotas (mixing prints and hand and eye data)
- Result can be system failure or abandonment

2. No authentication at point of service

- Raises question about value of the exercise

→ Is biometrics sometimes a placebo?

Conclusion: Some Implications

- Developing country needs and context are different from those in rich countries
- Evidence suggests that (biometric) ID can make a multi-faceted contribution to development
- Still concerns on the security of systems: both spoofing and breaking
- Implementation has to both be inclusive and reinforce incentives for integrity
- New technology can improve both but must fit context

Thank You