STATE OF AADHAAR REPORT 2017-18

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Ronald Abraham
Elizabeth S. Bennett
Rajesh Bhusal
Shreya Dubey
Qian (Sindy) Li
Akash Pattanayak
Neil Buddy Shah

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Omidyar Network has committed more than $1 billion to for-profit companies and nonprofit organisations that foster economic advancement and encourage individual participation across multiple areas, including Digital Identity, Education, Emerging Tech, Financial Inclusion, Governance & Citizen Engagement, and Property Rights.

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PREFACE

In last year's State of Aadhaar Report, we drafted a comprehensive, empirical, and structured review of the Aadhaar landscape. This foundational assessment aimed to promote a more fact-based understanding of the ecosystem at-large. And more critically, we used this analysis to identify areas where more research was needed to understand whether and how Aadhaar can advance the welfare of India's residents.

For this year's report, we aimed to dive deeper into key issues in order to contribute primary research on critical topics highlighted in last year's report. After a series of consultations, we decided to conduct state-representative large-scale surveys to understand how individuals interact with and perceive Aadhaar. This allowed us to empirically explore important issues that to date were discussed without the support of rigorous evidence.

The main results of that survey are contained within these pages, supplemented with other independent research and additional data from the government.

During our initial phase of research design we received valuable inputs from a wide range of thought-leaders and researchers, including: Alan Gelb, Anurodh Giri, Avani Kapur, Reetika Khera, Vijay Madan, Anit Mukherjee, Ajay Bhushan Pandey, Vaishnavi Prathap, Malavika Raghavan, Emrys Schoemaker, Ajay Shah, and Janaki Srinivasan. We are thankful for their time and efforts.

This report would not have been possible without our incredible team at IDinsight. We are grateful to Doug Johnson for his thoughtful feedback as well as Ruchika Joshi for her contributions in our efforts to engage in a data-driven discourse. We also appreciate technical input and reviews from Qayam Jetha, Akib Khan, Jeff McManus, Marc Shotland, and Dan Stein – as well as feedback on our questionnaire from Heather Lanthorn.

We are thankful to Adi Raval and Divya Sooryakumar for their contributions to our communications strategy. We also benefited from the support and patience of the entire IDinsight Delhi office as they helped us brainstorm and work through these important issues.

And we appreciate the efforts of Syed Maqbool, Vinod Sharma, and Lalit Nayak who helped to lead our field teams in Andhra Pradesh, Rajasthan, and West Bengal, respectively.

Omidyar Network (ON) has continued to be a supportive thought-partner throughout this entire journey. In particular, we would like to convey our sincere appreciation for the efforts of CV Madhukar, Subhashish Bhadra, Roopa Kudva, Mike Kubzansky, and ON's entire Digital ID team.

The report itself has greatly benefited from the expertise of our design firm, Studio Subu, as well as our editor, Allan R. Gold.

Lastly, for their tireless efforts, we would like to thank our co-authors: Neil Buddy Shah, Qian (Sindy) Li, Rajesh Bhusal, Shreya Dubey, and Akash Pattanayak.

As always, any shortcomings in the report are our own. We hope this report facilitates meaningful dialogue on digital identity – both in India and abroad.

Ron and Elizabeth

EXECUTIVE SUMMARY

Aadhaar provides identification to more than 1.2 billion Indian residents. Its scale, ability to uniquely identify individuals, and digital interface make it a compelling identification platform. These same features also raise questions about privacy, data security, and exclusion. The current debate on Aadhaar is binary in nature: either Aadhaar should be jettisoned or scaled aggressively. However, the facts on the ground—as revealed by our three-state survey on Aadhaar, the largest to date—support a more nuanced approach. Our report's key takeaways explain why.

IDinsightÕs State of Aadhaar initiative aims to catalyse data-driven discourse and decision-making in the Aadhaar ecosystem. This report, the initiativeÕs flagship output, aims to provide a holistic and empirically grounded assessment of the state of Aadhaar.

Note: Numbers indicate randomly sampled rural households in each state

KEY TAKEAWAYS

Aadhaar's coverage is widespread, but the quality of the data has room for improvement.

Demographic error-rate in Aadhaar is 8.8% vs. 5.7% for voter ID

A majority of Indians value privacy, but also approve of linking Aadhaar to services.

Approval for mandatory linking of Aadhaar to government services; for private services, corresponding figure is 77%

Aadhaar's analog version (the letter) is much more widely used to open bank accounts than its digital version (e-KYC).

67% used Aadhaar letter; rest used other IDs; data for most recently opened bank account

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Exclusion from food ration (PDS) due to Aadhaar-related factors is significant, but lower than non-Aadhaar factors.

This extrapolates to ~1.2 million people per month in Rajasthan; non-Aadhaar factors account for 6.5% (or ~ 3.7 million people) of food ration (PDS) recipients excluded per month

Unless specified, all data cited in the executive summary are from our survey and apply to rural areas of Andhra Pradesh, Rajasthan, and West Bengal.

AADHAAR PLATFORM

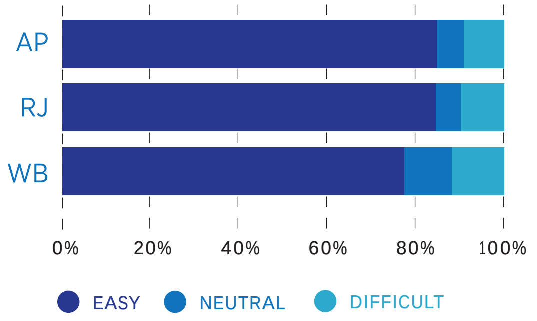
Aadhaar has rapidly become the foundational identity document of Indian residents. It has achieved near-universality in its coverage and acceptance in India. We review key highlights of what has worked, what has not, and recommended next steps.

1. WHAT HAS WORKED?

Most people have an Aadhaar number and most felt it was easy to enroll

We find no evidence of differences in enrolment by gender, caste, religion, or education level.

USER PERCEPTION OF AADHAAR ENROLMENT PROCESS



In Andhra Pradesh and West Bengal, a relatively small number of people were wrongly charged an enrolment fee. However, in Rajasthan 24% paid a fee.

2. WHAT HAS NOT WORKED?

Aadhaar data has more self-reported errors than the voter ID database

ERROR COMPARISION (VOTER ID VS AADHAAR)

	IN VOTER ID	IN AADHAAR
ANDHRA PRADESH	2.4%	8.0%
RAJASTHAN	2.6%	4.8%
WEST BENGAL	10.4%	12.2%

ERRORS WITHIN AADHAAR

	NAME	ADDRESS	DOB
ANDHRA PRADESH	3.8%	1.2%	2.6%
RAJASTHAN	1.5%	0.7%	2.4%
WEST BENGAL	5.6%	1.7%	3.5%

People also encountered more challenges with the process of updating their Aadhaar, compared to the process of enrolling, such as paying higher-than-required fees.

3. EMERGING POLICY RECOMMENDATIONS

Facilitate updates to correct Aadhaar data

To reduce the number of errors in Aadhaar data, conduct “update campaigns” and set up camps, similar to the enrolment camps that were well-received and worked well in increasing Aadhaar coverage.

Reinforce awareness of fees and processes for enrolment and updates

Of those who paid higher-than-required fees, majority were unaware of the actual cost. Conduct awareness campaign around fees and processes, especially for vulnerable groups. Install a strong grievance redress mechanism.

AADHAAR AND FINANCIAL INCLUSION

The “Jan Dhan” banking scheme, Aadhaar, and mobile (together called “JAM”) are meant to play a pivotal role in the inclusion of unbanked, and underbanked, into the formal financial sector. There are two main channels through which Aadhaar can help increase financial inclusion:

1 Open a bank account with an Aadhaar letter or e-KYC

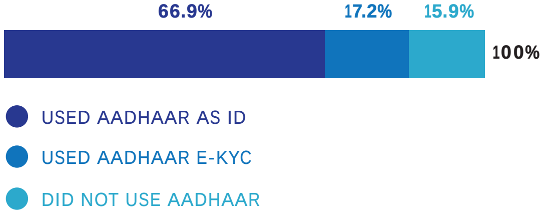
2 Increase account usage through microATMs & DBTs

1. WHAT HAS WORKED?

Aadhaar has become a common proof-of-ID for bank account opening

The ubiquity of Aadhaar and its universal acceptance has meant a high proportion of people use it to open a bank account. However, 66.9% used their Aadhaar as an analog, paper ID not e-KYC (used by 17.2%).

USE OF AADHAAR IN OPENING MOST RECENT BANK ACCOUNT



2. WHAT HAS NOT WORKED?

Use of microATMs remains low; e-KYC may not quicken a/c opening

Only 17% of account-holders had recently used a microATM.

No meaningful difference in time reported to open an account with e-KYC vs. traditional KYC.

% OF RESPONDENTS WHO GOT ACCESS TO AN ACCOUNT WITHIN 1 DAY

3. EMERGING POLICY RECOMMENDATIONS

Strengthen business correspondent network

Too few people currently have access to alternatives to brick-and-mortar banks. Ready access to microATMs could change this; however, the network supporting business correspondents (BCs) needs to be strengthened.

Push toward mobile-based financial services

In the absence of a sustainable BC network, there is opportunity for mobile-based financial services to provide greater access to accounts, and help reduce dormancy. These services are able to use Aadhaar as an identity platform.

AADHAAR AND FOOD RATION (PDS)

Aadhaar is envisioned as a key reform in India's social protection programmes for the poor, especially the delivery of food ration subsidies via the Public Distribution System (PDS). Aadhaar's two main uses in PDS have grown steadily over the last year.

1 Aadhaar seeding (aims to remove duplicate and fake entries from databases)

2 Aadhaar-based biometric authentication (aims to prevent access to non-genuine persons)

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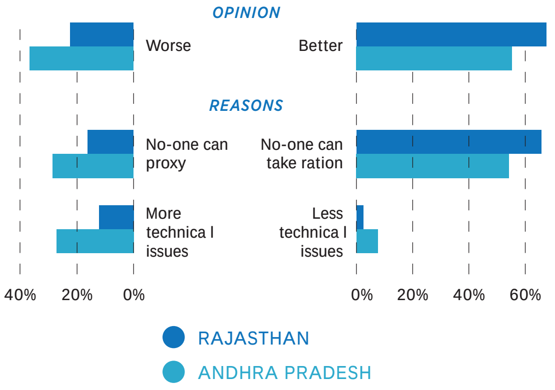
1. WHAT HAS WORKED?

Households feel secure that no one else can take their ration

Majority in Andhra Pradesh and Rajasthan prefer Aadhaar-based PDS delivery as they perceive biometric authentication prevents identity fraud.



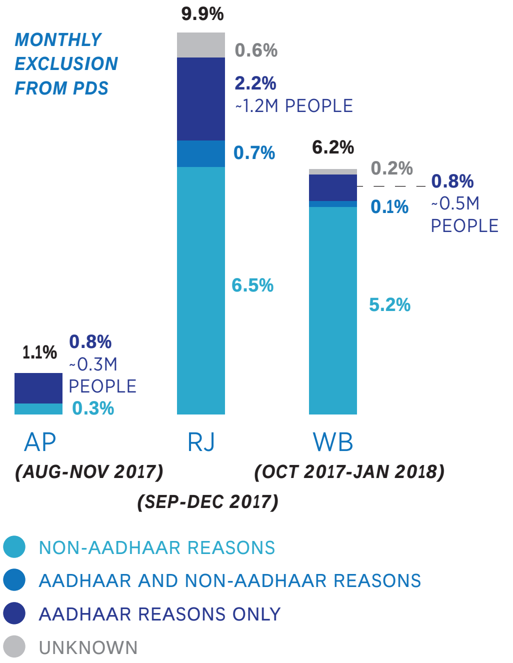
But biometrics is also the reason a quarter of the beneficiaries consider the system worse, as it reduces flexibility to send a proxy to collect ration on one's behalf.

For a more comprehensive treatment of these topics, please read the full report. To download the report, the technical appendix with tables, and learn about our research methodology, please visitwww.StateofAadhaar.in.

2. WHAT HAS NOT WORKED?

Exclusion from receiving benefits due to Aadhaar-related factors significant

0.8%, 2.2%, and 0.8% of PDS beneficiaries in rural Andhra Pradesh, Rajasthan, and West Bengal, respectively, are excluded from their entitlements due to Aadhaar-related factors. This extrapolates to ~2 million individuals monthly. However, non-Aadhaar reasons, such as ration unavailability, contribute much more to exclusion from PDS.



3. EMERGING POLICY RECOMMENDATIONS

To reduce programme exclusion, re-consider monthly biometric authentication

Explore alternative technologies (e.g., offline authentication) or processes (e.g., annual verification) that provide a similar secure experience, but reduce Aadhaar-related exclusion.

Enforce rules allowing alternate IDs or authentication mechanisms

Mechanisms are in place to ensure benefits are not denied due to Aadhaar: enforce these strongly. Awareness of other authentication means (e.g., mobile OTP) is low: popularise them.

LEGAL HIGHLIGHTS OF THE AADHAAR PLATFORM

In August 2017, the Supreme Court ruled that privacy is a fundamental constitutional right.

An overwhelming majority of Indians care about their right to privacy; more than 96% of respondents stated it is important for them to know how their Aadhaar information is used by the government.

AADHAAR AND TELECOM: QUICK HIGHLIGHTS

77% of respondents approved of the mandatory linking of Aadhaar to services, including mobile

More than 50% of respondents who got a SIM card in late 2016 or after, used e-KYC to do so

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INTRODUCTION

Aadhaar currently provides identification to more than 1.2 billion Indian residents, or more than 90 percent of India's population. Its scale, ability to uniquely identify individuals, and digital interface make it a compelling identification platform for use by the government, civil society, and private sector. These same features, however, raise questions about privacy, data security, and exclusion of vulnerable populations.

These concerns came to the fore on multiple occasions this past year, one of the most eventful since Aadhaar's inception in 2009. In Figure 1.1, we provide a timeline of these significant events.

Throughout this year, however, the discourse was fractious and polarized. Those challenging Aadhaar contended that it is a tool for surveillance and disempowerment of the poor and called for jettisoning the project. Those in government posited that Aadhaar empowers the poor, saves money for the exchequer, and increases state capacity. Their resulting policy prescription is to aggressively scale the use of Aadhaar.

We at the State of Aadhaarinitiative believe that instead of this false dichotomy, India requires a more nuanced and empirically grounded discourse and decision-making ecosystem around Aadhaar. We advocate for a careful and case-by-case evaluation of Aadhaar's applications using objective data and evidence, in order to inform whether a given use should be advanced, adjusted, or abandoned.

For the first time in Aadhaar's history, we now have an opportunity to catalyse such a data-rich discourse. In the last one year, more robust and independent evidence on how Aadhaar is working has been generated than in any preceding year. The State of Aadhaar Survey 2017-18 (SOA survey) advances the evidence base with the largest survey on Aadhaar to date. The survey provides data representative of the rural populations of three states in India: Andhra Pradesh, Rajasthan, and West Bengal. Given the three states' varying cultural contexts, governance capacity, and take-up of Aadhaar use-cases, they also provide an indicative understanding of Aadhaar's status quo nationally. This survey, in conjunction with other published research and official data, form the basis for this report.

Our findings suggest that important reforms are required for Aadhaar to realise its potential, while simultaneously limiting the risks it poses. To make genuine progress on the role of Aadhaar within India, we invite a vigorous debate on our findings and their policy implications. We hope this debate advances objective, data-driven discourse and decision-making on Aadhaar, and motivates more independent research to answer questions as they arise. This type of empirical approach, we believe, will best serve the interests of the country's more than 1.3 billion residents.

Figure 1.1. Significant Aadhaar developments in Financial Year (FY) 2017-18

June 1: Ministry of Finance order mandates linking of Aadhaar with bank accounts

June 9: Supreme Court allows Aadhaar-PAN linkage

August 24: Supreme Court upholds the right to privacy as a fundamental right

October 16: Newspaper reports claim a 11-year old dies of starvation as her family was denied food subsidies due to their ration card not being linked to Aadhaar

November 19: Unique Identification Authority of India (UIDAI), in a Right to Information (RTI) reply, stated that 210 government websites disclosed Aadhaar data

November 27: Government of India releases a white paper on “Data Protection Framework for India”

January 4: Journalist for The Tribune reported that she was able to buy unauthorised access to a UIDAI portal enabling her to get demographic details of any individual upon entering a valid Aadhaar number

January 10: UIDAI announced virtual ID, limited e-KYC, and UID token

January 17: Five-judge constitution bench begins hearing 30 petitions challenging Aadhaar

Sources: Supreme Court orders, MeitY notification, newspaper reports

New to Aadhaar?
This report is written assuming a basic understanding of Aadhaar and its uses. If you require a primer, however, we suggest reading our first report:
State of Aadhaar Report 2016-17

RESEARCH METHODOLOGY

The *State of Aadhaar Report 2017-18* combines primary data collected from the SOA survey with secondary research that draws on administrative data and published research on Aadhaar.

State of Aadhaar Survey 2017-18

The survey is designed to provide representative state-level estimates of the rural populations of Andhra Pradesh, Rajasthan, and West Bengal. The states were chosen to be geographically distributed across India, representing diverse contexts of culture and state capacity. In addition, these states have varying penetration of Aadhaar in terms of enrolment and linkages to services.

A total of 2,947 households were surveyed in person (see Figure 1.2). The sample size was selected to maximise the precision of the estimates while managing operational constraints. We used the Election Commission's public, online voter ID database to construct the sampling frame. Sample selection used the probability proportional to size (PPS) method to sample districts (stratified by region) and sub-district units. Simple random sampling was used to select households and again to select individual respondents within households.[1]

Secondary Research

Other sources for this report include data from various public portals maintained by the central and state governments, government reports and documents, and published independent research. Please see our full list of references at the end of the report.

Figure 1.2: State of Aadhaar Survey 2017-18, sample description

	AP	RJ	WB	ALL 3 STATES
Number of sampled households (and respondents)	1,142	965	840	2,947
Number of sampled household members	4,454	5,430	3,785	13,669
Number of sampled districts	6 (of 13)	8 (of 33)	7 (of 23)	21 (of 69)
Dates of survey	Nov-Dec 2017	Dec 2017 - Jan 2018	Jan-Feb 2018	Nov 2017 - Feb 2018
2017 rural population	34.8m	57.7m	65.9m	158.4m

Note: 2017 rural population estimates calculated using data from UIDAI and Census.
A detailed technical note on the survey methodology is available on www.StateofAadhaar.in.

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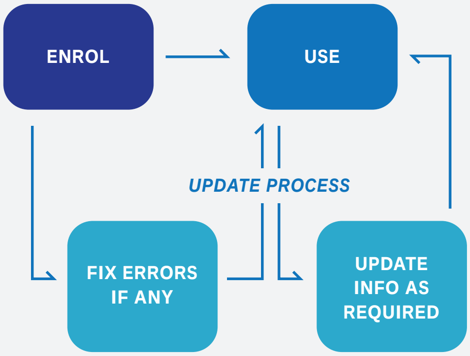
[1] One adult per household was selected to be the respondent. Some survey questions only concern the respondent themselves, while others concern all members of the household, including children.

AADHAAR PLATFORM

Aadhaar is the world's largest publicly run digital identity database and it continues to grow. The database contains 1.2 billion enrollees and has facilitated nearly 24 billion digital authentications (Unique Identification Authority of India 2018). This demonstrates phenomenal growth since the first Aadhaar was issued in 2010, yet key questions related to the platform – enrolment and updating processes, usage, and data quality – remain unanswered. As we show in Figure 2.1, these areas comprise the major touchpoints with the Aadhaar system.

With the State of Aadhaar Survey 2017-18 (SOA survey), along with government administrative data, we begin providing initial answers in this section. Specifically, we seek to answer the following critical questions:

Figure 2.1: Interactions with the Aadhaar System



1. What are people's experience with the Aadhaar enrolment process? To what extent are people excluded from the Aadhaar platform itself?
2. How do people use their Aadhaar? What are the most common usages?
3. What is the quality of the demographic data captured by Aadhaar? What are individuals' experiences regarding fixing errors or updating their Aadhaar?

The next subsections discuss our findings related to these questions. This is followed by a discussion on our recommended next steps informed by the findings.

AADHAAR ENROLMENT

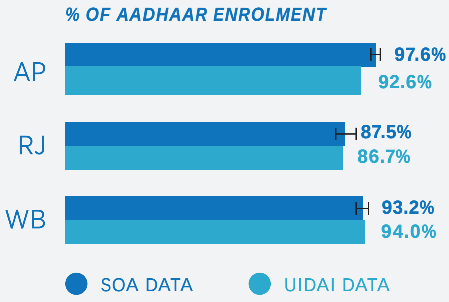
Overall Enrolment Trends in the SOA survey

The enrolment saturation rates from the SOA survey support the UIDAI's saturation data (see Figure 2.2). Beyond the high saturation rate of more than 90 percent, we looked into enrolment by different demographics. We do not find that members of vulnerable communities are less likely to be enrolled.[2] This is indicative that exclusion from Aadhaar is not only low, but also not systematically biased against the poor or vulnerable.

For those who tried to enrol in the Aadhaar system but were turned away (1 percent of all household members across the three states), we sought to understand why. The most common reason for rejection was "ineligibility due to biometrics" which was 30.9 percent across all three states.[3,4] Given the centrality of biometric capture to the Aadhaar platform, the UIDAI should look into this issue further to determine root causes and to develop technological or manual solutions.

An important motivation for Aadhaar at the time of its inception was to provide formal identification to those who did not have one. However, in our survey, more than 99 percent of respondents in all three states had at least one other form of ID at the time of enrolment.[5] This finding is also in line with an RTI response that demonstrated the number of enrolments that used the introducer system accounted for only 0.02 percent of total enrolments (Sharma (RTI) 2015).[6]

Figure 2.2: Comparison of SOA data and UIDAI data on enrolment



Note: Error bars denote 95% confidence intervals
Number of observations: AP (4,448); RJ (5,396); WB (3,778)
Data sources: State of Aadhaar Survey 2017-18;
UIDAI State-wise Saturation Report, March 31, 2018

The most common forms of identification were ration cards and voter IDs. While both of these IDs are widely accepted, it should be noted that they also have limitations. Ration cards, in most states, are provided at the household level, not the individual level. Voter IDs are restricted to those eligible to vote—meaning eighteen years old and above. Thus, neither form of ID is universal in quite the same way as Aadhaar. A comparison of saturation rates for Aadhaar and voter ID in the three states we surveyed can be seen in Figure 2.3.

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[2] We tested for differences in the following populations: gender, religion, age, and caste. We found that respondents above the age of 60 are more likely to be enrolled. When conducting hypothesis tests for difference in outcomes between various groups we correct for multiple hypothesis testing using the Bonferroni correction. This applies to all hypothesis tests contained in this report.

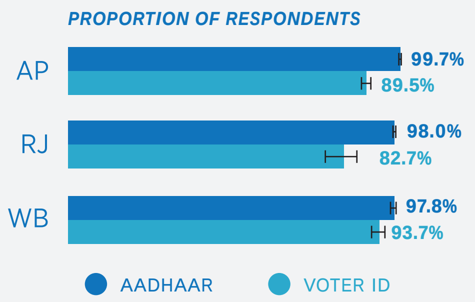
[3] "Ineligibility due to biometrics" refers to cases where residents were told that their biometrics are not of sufficient quality to enrol in Aadhaar.

[4] There was variation across states; however, the number of state-level observations was too small to be able to report on any differences across states.

[5] In the survey, we used voter rolls to construct the sampling framework. We are fairly confident that our sample captures households where some members of the household may have been left off the voter roll (as evidenced by the fact that more than 10 percent of adults within the sample did not have a voter ID). However, one limitation of the survey is that we would have been unable to capture households where no single member is on the voter list. For more details about the survey methodology, including limitations, please see www.StateofAadhaar.in.

[6] The introducer system is intended to be an avenue of enrolment for individuals unable to provide proofs-of-identity.

Figure 2.3: Comparison of saturation level in Aadhaar and voter ID for adult population



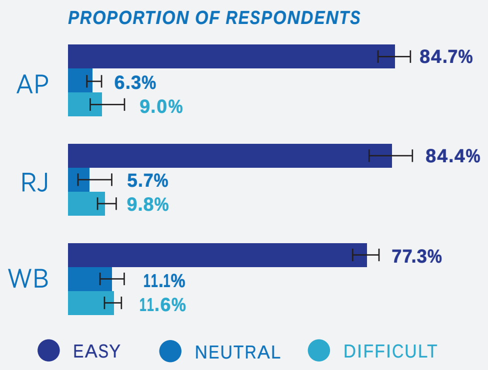
Note: Error bars denote 95% confidence intervals
Number of observations (Aadhaar): AP (3,415); RJ (3,553); WB (2,810) Number of observations (voter ID): AP (3,399); RJ (3,553); WB (2,807)
Data source: State of Aadhaar Survey 2017-18

Analysing the enrolment process

The UIDAI has built a sizeable infrastructure for the purposes of enrolment. We describe this infrastructure in the Aadhaar Architecture chapter of the State of Aadhaar Report 2016-17In this year's report we focus on the efficacy of these systems, the resulting user experience, and user perceptions of the enrolment process.

UIDAI regulations state that enrolment in Aadhaar is free and no entity can charge a fee for this service (UIDAI 2016). However, findings from our survey show that this regulation has not always borne out in practice. The highest incidence of deviation was found in Rajasthan, with 23.7 percent of people stating that they paid to enrol in Aadhaar. Those in Andhra Pradesh and West Bengal experienced this issue as well with 9.0 percent and 5.7 percent of people, respectively, paying to enrol. Those who enrolled in an Aadhaar camp were less likely to have paid for enrolment in all three states.

Figure 2.4: User perception of Aadhaar enrolment process



Note: Error bars denote 95% confidence intervals
Number of observations: AP (1,140); RJ (950); WB (826)
Data sources: State of Aadhaar Survey 2017-18

While many enrollees reported facing inconveniences such as failed enrolment or the charging of unnecessary fees, an overwhelming majority of the respondents in all three states indicated they found the enrolment process to be "easy" (see Figure 2.4).

AADHAAR USAGE AND AWARENESS

A critical but largely unanswered question is how do people tend to use their Aadhaar. Below, we explore the most common types of uses and look into how many people use each type.

Usage to establish identity

The most common reported use of Aadhaar for establishing identity is providing a photocopy of one's Aadhaar letter.[7] More than 93 percent of respondents in all three states claimed they have used Aadhaar in this way to establish their identity (see Figure 2.5). The next most common usage is fingerprint authentication. While this use is widespread in Andhra Pradesh (95.4 percent) and Rajasthan (76.7 percent), it is less common in West Bengal (48.8 percent). One probable explanation is the fact that West Bengal's ration system does not currently use Aadhaar-based biometric authentication at a large scale. Iris authentication usage in Andhra Pradesh is much higher than in Rajasthan and West Bengal. This is likely due to the use of iris authentication in the Public Distribution System (PDS) and cash withdrawals from iris-enabled microATMs.

Data from the UIDAI shows that the number of overall Aadhaar authentications is growing steadily. Similarly, the number of unique IDs (UIDs) authenticated continues to trend upward (UIDAI 2018). In February 2018, 271 million individuals used their Aadhaar to authenticate themselves, representing nearly one in four people in possession of an Aadhaar (see Figure 2.6).

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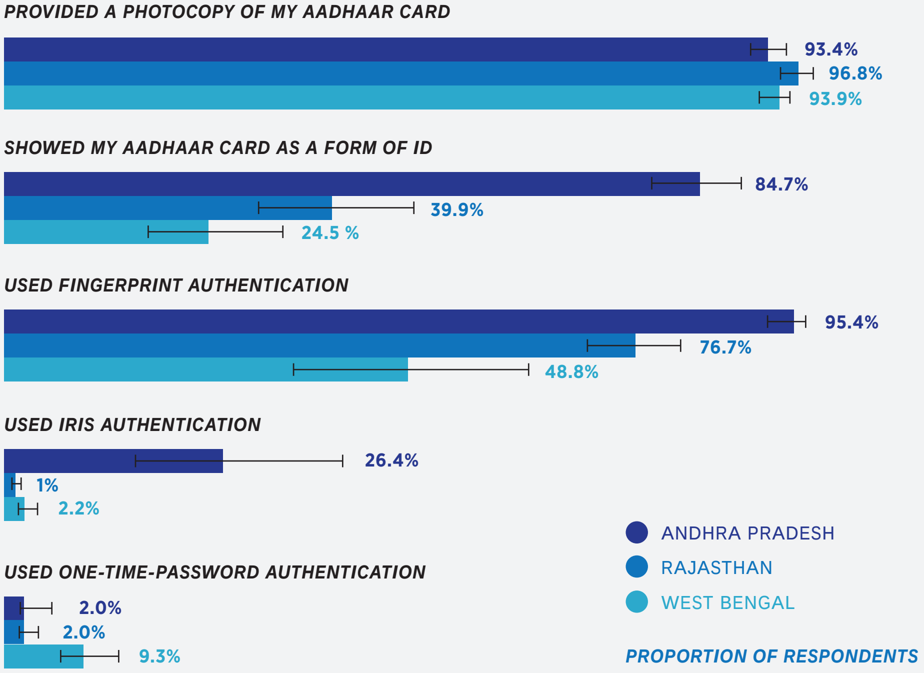
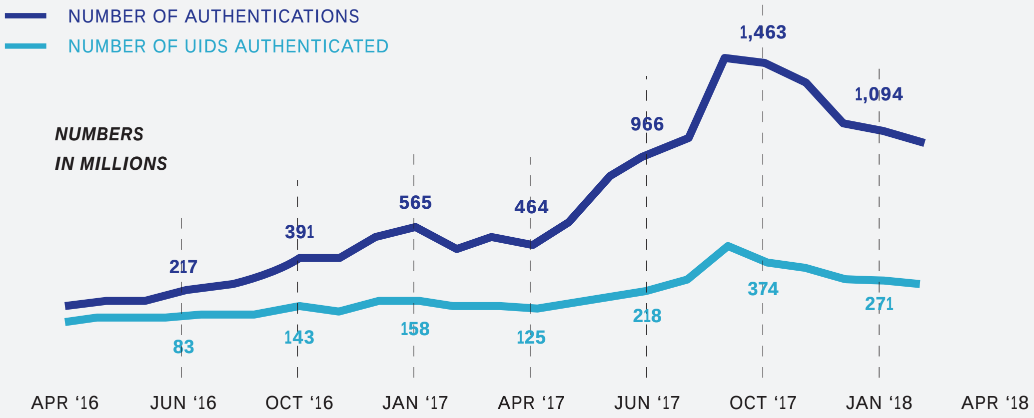
[7] The Aadhaar letter – sometimes referred to as an "Aadhaar card" – is issued by the UIDAI. The letter contains one's Aadhaar number, demographic details, and photograph. Throughout this report we refer to the letter as an "analog" or "non-digital" ID to differentiate between the biometrically-enabled aspects of the ID.

Figure 2.5: Different uses of Aadhaar by residents



Note: Error bars denote 95% confidence intervals
Number of observations: AP (1,142); RJ (952); WB (825)
Data source: State of Aadhaar Survey 2017-18

Figure 2.6: Aadhaar authentication and unique residents authenticated over time, Apr 2016 – Feb 2018



Data source: UIDAI Dashboard

Awareness

In our survey we asked a series of questions about awareness to understand which features and functionalities people understood regarding Aadhaar.

See Figure 2.7 for an assessment of awareness levels for the three states in our survey. The UIDAI has set up regulations and systems to improve access and also safeguard its end users. However, lack of user awareness has limited the impact of these steps.

EVOLVING FEATURES OF AADHAAR

To try and address growing concerns about privacy and data security, the UIDAI recently launched three features: Virtual ID, Limited KYC, and UID token.

Virtual ID (VID) is a temporary 16-digit random number that can be generated by residents against their Aadhaar numbers. VID, along with one's biometrics, can be used to authenticate oneself. The introduction of VID tackles privacy concerns in two ways. One, it prevents agencies from linking databases using Aadhaar's unique identifier since each agency will only have access to the temporary VID. Two, it allows an individual to have a choice about when (and with whom) they share their Aadhaar number.

Limited Know-Your-Customer (KYC) is being introduced to regulate the storing of Aadhaar numbers in different databases. As per the UIDAI's notification, the authority plans to allow only authentication agencies that are required by law to receive full demographic information along with the Aadhaar number of an individual. The remaining agencies will be subject to Limited KYC and will not be allowed to store Aadhaar numbers upon authentication.

To facilitate uniqueness and security of beneficiaries in the authentication agencies' databases, the UIDAI aims to introduce a system called UID Token. With this system, each individual Aadhaar number is given a unique token ID for an authentication agency. That token is used for each transaction with that agency, but not used anywhere beyond that agency (UIDAI 2018). This too prevents different agencies from linking databases as each agency has a unique token for an individual that cannot be mapped to the token of that individual from another database.

Efforts to advance and evolve security features to better protect residents should be encouraged. However, given low levels of awareness of other security features such as biometric locking, simply offering these features is unlikely to result in sufficient uptake (see Figure 2.7). The government should engage in thoughtful campaigns, targeted toward individual users and institutions requiring Aadhaar for identification to ensure the objectives of these initiatives are met. Finally, these measures, and the processes accompanying them, need careful and rapid testing to ensure they are optimised to provide a seamless and effective layer of protection.

Figure 2.7: Proportion of Aadhaar awareness levels among survey respondents

CATEGORY	ISSUE	AP	RJ	WB	ALL 3 STATES
Authentication Awareness	Awareness of fingerprint authentication	97.8	87.6	71.5	85.1
	Awareness of iris authentication	45.7	15.4	30.8	31.0
	Awareness of OTP authentication	6.1	10.0	13.9	10.1
	Awareness of all three	5.8	7.2	8.7	7.2
UIDAI Regulations	Enrolment is free of cost	40.2	41.0	43.3	41.6
	Updating should cost only ₹15	4.8	11.8	8.0	7.3
Security Features	Aware of biometric locking & unlocking	2.0	3.4	3.9	3.1

Note: The fee charged for updates was ₹15 but has recently been increased to ₹25
Number of observations: The number of observations reported above varies by question and by state. Most questions were asked to all respondents who have an Aadhaar, with variation arising from the removal of "don't know" responses. However, the question on cost of updating was only asked to a relevant subset (275). See the technical appendix on www.StateofAadhaar.in for more details.
Data source: State of Aadhaar Survey 2017-18

AADHAAR DATA QUALITY AND UPDATING DATA

While saturation levels are important, it is equally imperative to ensure that the information collected is accurate. Low data quality would lead to errors in seeding and a less reliable e-KYC process. Through our survey, we wanted to gain a better understanding of the quality of the demographic data captured through Aadhaar. To understand this vital component of Aadhaar, we examined several related indicators, such as the proportion of respondents that self-reported an error in their Aadhaar data, the frequency of updating (due to errors or a need to update information), and the proportion of duplicates in the system. We also wanted to understand people's experience with the updating process.

Data quality

At the peak of the enrolment process, the UIDAI was facilitating enrolment of nearly one million people a day (State of Aadhaar Report 2016-17). This raises the question about whether the scale of the enrolment made the exercise vulnerable to data entry errors. When asked, 8.8 percent of people stated that their Aadhaar letter contained an error. The errors are self-reported and there is reason to believe these are a lower-bound estimate for errors.[8]

To interpret the errors compared with the most widely used alternative, we also asked if respondents had errors in their voter ID cards. We see that in Andhra Pradesh and Rajasthan the proportion of respondents with errors in Aadhaar are more than three times and nearly two times higher than for voter IDs, respectively, while in West Bengal the Aadhaar error rate is higher, though the difference is not as extreme (see Figure 2.8).

We also wanted to identify which types of information are most error-prone. The most common source of error in Andhra Pradesh and West Bengal was the name of the respondent, while in Rajasthan date of birth contained the highest number of self-reported errors (see Figure 2.9). The magnitude of error(s) also matters in terms of how the error affects people. Of those who reported an error in their name, about one-third claimed their full name was wrong while two-thirds noted an incorrect spelling. We also asked respondents about the perceived source of the error. Eighty-nine percent reported their error(s) was due to data entry mistakes while 10.3 percent stated a pre-existing error in a source document. The remaining errors were attributed to mistakes made by the respondents themselves.

The UIDAI has established processes for the correction of errors in Aadhaar. Most who tried to get their error rectified claimed to be successful. However, only 53.0 percent of those with errors actually reported trying to get the error corrected. An important concern that emerges from the data on the enrolment process is that of the

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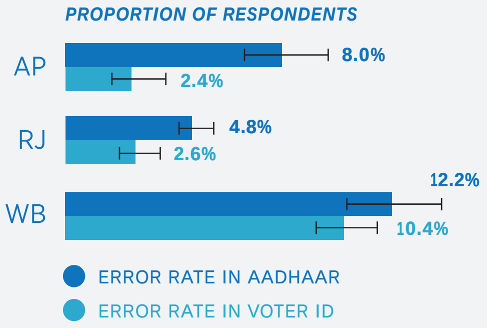
[8] We believe self-reported errors will be lower than externally verified errors. This assumes that respondents are more likely to report an error that has affected their ability to use their Aadhaar or access services, and less likely to report an error if it does not impede any uses. For example, a name may be misspelled or wrongly transliterated from another language into English, but a respondent would likely only report the error if it has led to service denials or other issues. Additionally, respondents who are not literate might not be able to tell if some information is incorrect.

respondents who paid to get the error fixed (82.4 percent), 96.0 percent reported paying more than the designated fee of ! 25.[9]

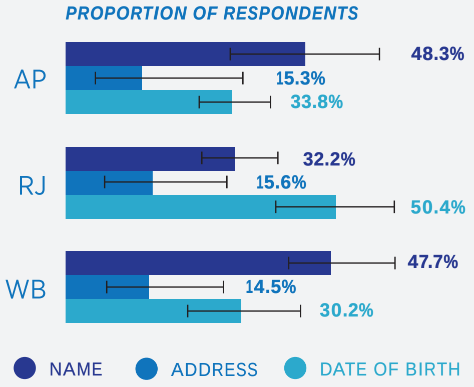
In contrast to the high number of respondents reporting ease in the enrolment process, the proportion is lower for the correction of errors. In Andhra Pradesh and Rajasthan 69.1 percent and 67.0 percent, respectively, stated that they found the process "easy."[10] In West Bengal, 47.8 percent of those who attempted to fix errors felt the process was "easy." This indicates that there are challenges or barriers in this process that should be addressed to improve the user experience and to ensure the accuracy of the Aadhaar data.

Figure 2.8: Comparison of errors in Aadhaar and voter ID



Note: Error bars denote 95% confidence intervals
Number of observations (Aadhaar): AP (4,275); RJ (4,669); WB (3,435)
Number of observations (voter ID): AP (2,999); RJ (2,934); WB (2,611)
Data source: State of Aadhaar Survey 2017-18

Figure 2.9: Types of error on Aadhaar letters with a demographic error



Note: Error bars denote 95% confidence intervals
Number of observations: AP (333); RJ (223); WB (410)
Data source: State of Aadhaar Survey 2017-18

Updating data

Updating Aadhaar data will become essential to ensuring accuracy of the information. This primarily involves updating contact details, photographs, and biometric information of children once they turn five and again at age fifteen, per the UIDAI requirements. Some updates are required on an ad hoc basis (updating one's address after a move) while some updates are cyclical (updating one's photo every ten years). The proportion of people that updated their data in cases where their address had changed was low (13.0 percent) amongst the three states. The proportion was higher (25.5 percent) in the case of updating mobile phones numbers.

DISCUSSION

As noted above, people were generally satisfied with the Aadhaar enrolment process. However, they faced greater challenges when fixing mistakes or updating information. Updates will be required as long as the system is in place. Consequently, the UIDAI should examine the successes of the enrolment system and think critically about how to improve the updating process.

As the administrator of the world's largest biometric database, the UIDAI will face significant challenges ensuring Aadhaar data remains current and updated. A system containing errors is likely to cause problems, ranging from minor inconveniences to serious threats of exclusion.

Similarly, some uses of Aadhaar authentication remain low, particularly OTP and iris authentication. Given fairly high rates of mobile penetration, it may be worthwhile for the UIDAI to invest in awareness campaigns aimed at the ease of OTP authentication. This could also provide relief for individuals who struggle to authenticate using their biometrics. Additionally, the overwhelmingly high use of Aadhaar in its analog form necessitates a greater focus on adding security features to the physical copy of Aadhaar as well. As Aadhaar's use as an identity platform continues to increase, it is vital for the underlying quality of its database to improve, along with well-established processes to continuously stay up to date. Having achieved exemplary scale, a renewed focus toward quality and updating processes may be important next steps for the UIDAI.

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[9] The fee charged for updates was ! 15 but has recently been increased to ! 25.

[10] The number of respondents who answered this question was less than fifty in Andhra Pradesh and Rajasthan.

DUPLICATE AADHAAR "CARDS"

One of the strongest arguments in favour of Aadhaar is the ability to create a database free of duplicate entries. The unique 12-digit number combined with individuals' unique biometric information is meant to create a system in which each individual is only entered once.

Our survey data suggests this is mostly true; however, we found three cases in which individuals possessed two Aadhaar letters—containing matching name and demographics but with a distinct unique ID number. At 0.1 percent of our sample, this represents a small but meaningful number.[11]

Based on UIDAI's performance data, the false acceptance rate was expected to be 0.035 percent (State of Aadhaar Report 2016-17). However, given di#erent estimation methods and the low incidence in our sample, we cannot strictly compare these two statistics.

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[11] A direct extrapolation of this number would be equivalent to 71,300 duplicates across the rural population of all three states. The 95 percent confidence interval around this estimate ranges from 3 to 213,900, meaning there is a wide variance on our estimate for how many duplicates may exist. However, we may want to think of this number as a lower-bound considering that anyone who intentionally obtained a second Aadhaar (for nefarious purposes) would likely not have shared this information with our survey team. Note that we confirmed that these were indeed duplicate Aadhaars and not the respondent mistaking their temporary enrollment ID to an Aadhaar number.

LEGAL

As we write this report, a five-judge constitution bench of the Supreme Court of India is hearing 30 petitions challenging the legality of Aadhaar. The Court is expected to answer foundational questions about the digital identify platform. Is the 2016 Aadhaar Act, passed as a Money Bill, constitutional? Is Aadhaar's use of biometrics in conformity with our newly codified right to privacy? Are the burdens borne by Indian residents due to the use of Aadhaar justified by the potential gains?

In answering these questions, the Supreme Court can play a crucial role in shaping our institutions and ability to manage risks in a fast-paced digital world. In August 2017, its landmark judgement on the right to privacy served as confirmation of this role. In addition, the Government of India has also set in motion a consultative process regarding the framing of a much-needed data protection law (Ministry of Electronics and Information Technology [MeitY] 2017).

In this chapter, we provide a brief overview of these legal developments in the Aadhaar ecosystem over the last year. We do not discuss the current set of petitions being heard in the Supreme Court as the matter has not concluded at the time of sending this report to print.