Well done ABBA?

Aadhaar and the Public Distribution System in Hyderabad
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The Aadhaar-based Biometric Authentication system was introduced in all Public Distribution System outlets in Hyderabad between February and March 2016. A survey of 80 households (284 persons) in November finds that despite the introduction of technology-intensive authentication and payment systems, a significant number of those vulnerable and dependent on PDS for food grains are failing to realise their right to food. It is alarming that these sophisticated systems fail even in locations where connectivity and technical know-how are relatively advanced.

Shoshana Amielle Magnet, in her book *When Biometrics Fail* (2011)*,* argues that biometric systems around the world have largely failed to provide their intended benefits and instead often ended up perpetuating gender, ethnic, cultural, and socio-economic inequalities.

Without heeding this warning, India's legislature directed the executive to leverage Aadhaar in Section 12 of the National Food Security Act (NFSA), 2013. Consequently, some state governments have introduced Aadhaar-based Biometric Authentication (ABBA) in the Public Distribution System (PDS), ostensibly to enhance "efficiency." However, echoing Magnet's arguments, recent evidence suggests that linking the PDS with Aadhaar is hindering efficiency. Researchers, journalists, and an Andhra Pradesh government-commissioned study have documented the disruption of welfare programmes that often follows the introduction of ABBA (Khera 2017; Drèze 2016; Ramakumar 2016; Yadav 2016; Matharu 2015).

The NFSA confers a legal right to subsidised foodgrains on "eligible households." While eligibility is a household characteristic (ration cards are made for households, not

individuals), entitlements are determined on a per capita basis.[1] The ABBA system was

introduced in all PDS outlets of the Greater Hyderabad Municipal Corporation (GHMC) in February and March 2016. Ever since, even among individuals of an eligible household (hereafter "eligible individuals"), only those with a valid Aadhaar number can become beneficiaries of the PDS. This requires their Aadhaar number to be seeded onto the PDS database and added to the household ration card. Other individuals are omitted and hence denied entitlements.[ii]

The ABBA system in PDS outlets is built around a set of "fragile technologies" (Drèze 2016) that need to work simultaneously for successful transaction. These are:

i. **Seeding of Aadhaar numbers:** An eligible individual can become a beneficiary and access the PDS system only if her Aadhaar number is correctly seeded onto the PDS database and added to the household ration card.
ii. **Point of Sale (PoS) machines:** The entire process at the PDS outlet is dependent on the PoS machine. If it malfunctions, no transaction can be made. The first step in the process requires the dealer to enter the ration card number of the beneficiary's household onto the PoS machine.
iii. **Internet connection:** Successful working of the PoS machine depends on internet connectivity as verification of the ration card number and the beneficiary's biometric fingerprint is carried out over the internet.
iv. **Remote Aadhaar servers:** Remote Aadhaar servers verify the ration card number and initiate fingerprint authentication.
v. **Fingerprint recognition software:** The beneficiary proves her identity by submitting to fingerprint recognition in the PoS machine. Upon verification, the PoS machine indicates that the beneficiary is genuine and that foodgrains can be distributed to her household.

The stated purpose of introducing ABBA in the PDS is to eliminate identity fraud (for example, duplicate or bogus beneficiaries) and reduce siphoning of grains by the dealers, thereby improving the delivery of welfare schemes "to the benefit of the poor." With its well-functioning connectivity, strong infrastructure, and tech-savvy government, Hyderabad offers a favourable context for ABBA. We decided to probe its workings in this seemingly best-case environment based on a household survey conducted in November 2016.

The Survey

We sought to examine the following issues:

i. Are eligible individuals being excluded due to the introduction of ABBA?
ii. What other issues crop up with the introduction of ABBA, barring exclusion?

A sample of 80 households ("surveyed" households) was drawn from roughly 1,300 households registered with two PDS outlets which were purposively selected for their location: one in the suburbs of Yapral and the other in Osman Gunj, less than two kilometres from the high court. We randomly selected 50 households that had successfully transacted via the ABBA system in the month of October ("successful" households) and 30 households that did not transact at the PDS in October ("no-show" households). This data was accessed from the Government of Telangana e-PDS website.

Table 1: Basic Facts

Households (HH) registered with the 2 PDS outlets of interest	1,381
Successful HH (no-show HH in brackets)	1,156 (225)
Eligible HH surveyed (individuals covered)	80 (284)
Successful HH surveyed (no-show HH surveyed)	50 (30)
Eligible individuals omitted from ration cards	34
Eligible individuals without Aadhaar card	10
No-show HH that failed transactions in October due to ABBA	8
Children not added to ration card (possibly due to lack of Aadhaar)	7
HH reporting 1 or more ABBA-related technology issue	53
HH reporting receipt of full entitlement at correct price prior to introduction of ABBA	71

Of the 80 households surveyed, 71 (89%) reported receiving full entitlements at correct prices even before the introduction of ABBA. Three of the remaining nine households reported mismatch between actual household size and the number of individuals on the ration card prior to the introduction of ABBA. The others were either unable to recall, or were newly identified eligible households. For the surveyed households at least, the PDS seemed to be working well before the introduction of ABBA.

The introduction of ABBA has, however, brought with it many complexities and problems. Although all 50 "successful" households received full entitlements at correct prices in October, eight of 30 (27%) no-show households reported failed transactions due to issues with ABBA. Further, 53 of 80 (66%) surveyed households reported glitches with one or more of the five technological components of the system (Table 1).

Exclusion Due to Aadhaar

The identification of eligible households involves two kinds of possible errors: (i) inclusion of

an ineligible household on the NFSA list ("inclusion errors"), and (ii) exclusion of an eligible household from the NFSA list ("exclusion errors"). While inclusion errors increase the financial burden of the state, exclusion errors can often leave poor families vulnerable to hunger. Since the PDS was introduced to overcome chronic hunger and malnutrition, exclusion errors should be of greater concern. Though Aadhaar is technically not an eligibility criterion, ABBA is *systematically* leading to exclusion at two levels.

First, the lack of an Aadhaar number automatically disqualifies eligible individuals from being listed in the household ration card. Among surveyed households, 12% (34 out of 284) of eligible individuals' names were missing from the ration cards, leading to a loss for the concerned household as PDS entitlements are defined in per capita terms (in Telangana, each beneficiary is entitled to 6 kg of grains per month). While there could be other reasons for missing names, 10 out of 34 reported the lack of an Aadhaar card as the reason and we suspect that seven children's names were missing due to Aadhaar (Table 1).

More than one-fifth (21%) of sample households reported Aadhaar seeding issues. Respondents had submitted all Aadhaar documents to their respective circle offices, but they found that their names were missing from the NFSA list.

Second, beneficiaries face persistent and pervasive issues related to ABBA. Among the surveyed households, 35 (70%) "successful" and 18 (60%) "no-show" households reported issues with one or more of the five technological components of the system (Table 2). A large part of our sample reported fingerprint authentication errors, Aadhaar seeding issues, and poor connectivity (discussed below). In all these cases, Aadhaar is creating discriminatory hassles and increasing transaction costs.

Among the 30 no-show households, eight reported ABBA-related issues that led to failed transactions: five resulted from fingerprint authentication errors and the rest from Aadhaar number or seeding issues. Three households expressed disinterest in the PDS, and two provided unclear responses when asked why they did not transact.

The remaining 17 of the no-show households reported unavoidable personal reasons (for example being out of station, hospitalisation, absence of a male member whose fingerprints works, etc). Administrations may disregard these legitimate hardships as exceptional personal problems that cannot be accommodated by broad policy. Note, however, that prior to the introduction of ABBA in Hyderabad, households could collect accumulated rations for up to three months when they were unable to do so for any month. With Aadhaar leveraging, this considerate and fair approach has been discontinued. The introduction of ABBA configured PoS machines enables the District Supply Officer (DSO) to track each PDS outlets' transactions online. At the start of each month, grains are released to the respective outlets after accounting for grains leftover from the last month. For example, if a PDS outlet must receive 100 kg of rice to disburse every month, but has 5 kg left over from last month, only 95 kg are delivered to the outlet for the next month's disbursal. Even in institutions like

the Indian Armed Forces, whose personnel receive rations in-kind, there is a pre-announced "mis-muster" date when rations missed from the previous month can be collected. Why deny PDS beneficiaries the same right?

Table 2: Issues Reported by Households at thr Time of Last ABBA Transaction

Issue Reported	Number of HH (% in brackets)	
	No-show HH	Successful HH
HH surveyed	30 (100)	50 (100)
Fingerprint authentication errors	11 (37)	20 (40)
Internet not working	4 (13)	18 (36)
PoS machine not working	0 (0)	8 (16)
Aadhaar numbers yet to be seeded	6 (20)	11 (22)
One or more ABBA technology related issue	18 (60)	35 (70)
More than 1 trip to the PDS outlet due to ABBA related errors	8 (27)	17 (34)

PoS Malfunction and Failed Fingerprint Authentication

The PoS is central to the ABBA system. While none of the no-show households reported PoS malfunction (most of them did not reach the stage of using it), eight of the successful households did. Almost 40% of the surveyed households reported persistent fingerprint authentication errors, that only specific fingers worked, or that only certain household member's fingerprints worked. Elderly persons and women engaged in domestic work or manual labour especially expressed distress over fingerprint authentication errors. Incidentally, early warnings of this issue were raised in early UIDAI documents (Committee on Biometrics–UIDAI 2009:4).

Poor Internet Connectivity

The internet is the essential infrastructure on which the ABBA rests. Despite Hyderabad's decent network facilities, 36% of successful and 13% of no-show households reported problems with internet connectivity. This implies delays in grain disbursal and having to make more than one visit to the PDS outlet. Between one-fourth and one-third "no-show" and "successful" households respectively had to make more than one trip. Internet connectivity has frustrated not just beneficiaries but also dealers. The dealer at Yapral complained of connectivity issues every day of the week after 8 pm (a time when beneficiaries could come after work). The dealer at Osman Gunj revealed having to face

internet issues for an hour or two every day. Both dealers expressed displeasure over the resultant slowing down of sales.

Poor technological construction of the machines, software, and the networks has resulted in unnecessary inconvenience and anxiety.

Plight of Elderly and the Disabled

We consistently found that the introduction of the ABBA system had led to the disenfranchisement of the elderly and the disabled, as access to NFSA entitlements became contingent on their ability to access affordable transport and the effectiveness of ABBA. These dual issues impeding access have arisen because ABBA requires beneficiaries to visit the PDS outlet personally for fingerprint authentication. In the earlier set-up, the elderly and the disabled relied on family and neighbours to collect grains for them. Now, even reaching the PDS shop is no guarantee of receiving entitlements due to technical issues with fingerprint authentication.

In Yapral, K Urmila, a widow who worked as a domestic help, has not been able to access her entitlements since April 2016 after suffering from a seizure and leg injury that have left her immobile. She can neither physically access public transportation nor financially afford a private rickshaw or auto to visit the PDS outlet. Had the ABBA not been in place, she could have sent her daughter to collect her entitlements for her. Urmila is just one of many such elderly persons we met.

Ration Card Woes

Lastly, we found several instances of persons still in possession of their old ration cards. Despite completing the application procedure and receiving official communication of approval via a paper slip or SMS, they had not received their new ration card and were not getting rations. They were not aware of any grievance redressal mechanism and were left hopeless in a bureaucratic limbo. Though it is not clear whether Aadhaar had anything to do with this, this is an illustration of chronic issues in the functioning of the PDS that cannot be resolved by ABBA, and from which ABBA is diverting attention.

Conclusions

It has mattered little to successive governments that their Aadhaar endeavours are in clear violation of several Supreme Court orders that have ruled (even after the passage of the Aadhaar bill in Lok Sabha) that Aadhaar cannot be mandatory to access welfare services

(Anand 2016).

Technocratic understanding of the efficiency of ABBA is ignorant of the multiple hardships that ABBA has created as well as aggravated. Among 80 surveyed households, 89% reported receiving full entitlements at correct prices even before the introduction of ABBA. In contrast, 10% of households are now excluded due to ABBA and two-thirds reported errors with one or more of its five technological components. If such is the state of affairs in urban, technologically sophisticated, and infrastructure-supported cities such as Hyderabad and Delhi (Shagun and Priya 2016), one can only imagine the magnitude of tragedies unleashed upon the beneficiaries in rural India. As Khera (2013) notes, while it is essential to deal with issues of duplication, less disruptive methods than Aadhaar such as food coupons, smart cards, and last-mile tracking can be used to produce the same effectiveness with far less administrative burden.

It is difficult to see how implementing Aadhaar has been to the "benefit of the poor" in Hyderabad. Although our sample may not be fully representative, the results suggest that the ABBA system is neither as efficient nor as dependable as it is made out to be, even in a seemingly best-case environment. A blind belief that technology will enhance efficiency seems to have ironically bred inefficiency.

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[i] However, under the Antyodaya Anna Yojana (AAY), the poorest of households get 35 kg of grain per month irrespective of household size.

[ii] In some other states, such as Jharkhand, the seeding of any household member's Aadhaar number ensures entitlements for the entire household.