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Abstract

The poverty reduction agenda has emphasised data-driven social assistance programmes, leading to an overrepresentation of 'the poor' in data infrastructures. Though such a shift aims to improve the accuracy of targeting tools, and makes use of rigorous modelling techniques, including recent developments such as machine learning, past inequalities, biases and exclusions are still distilled into black-boxed eligibility protocols, e.g., proxy-means tests. The paper draws from qualitative research to explore and analyse what is missing from the social registries, exploring possible biases and omissions. It is found that missing data have material implications regarding access to the targeted social protection programme in Ecuador: Bono de Desarrollo Humano and their consequences in terms of accountability and trust in state-provided services and benefits.

Keywords: data; proxy means test; targeting; cash transfers; social registries.

Introduction

Following the onset of the COVID-19 pandemic, data have been at the centre of the social policy response and programmes delivery. The importance of data is captured in the latest World Development Report entitled Data for Better Lives (World Bank, 2021), which signals this moment as a 'data revolution that could touch all aspects of societies and economies' (pp, 3). The potential of data is perceived as limitless, for data can be reused and repurposed by government initiatives and private actors. Automated systems are increasingly making decisions on social and economic rights in a raft of data-driven policymaking.

The shift towards data-driven policymaking is not new. Data for social policy has aimed to regulate or even do away with what is often considered ideologically driven and even corrupt bureaucracy. Behind this shift, it is assumed that data-driven policy can eliminate personal biases by removing humans from the loop in what could be regarded as technical fairness (D'Ignazio & Klein, 2020). Nevertheless, together with biases, elements of empathy might also be erased from policy design and service delivery, replacing social workers with automated

systems that apply rigid criteria, no matter the circumstances. Furthermore, the data are not neutral. The outcomes of algorithms and data protocols can replicate built-in biases that, unknowingly or not, accompany data collection, analysis, and mapping of results. Hence, more data in policymaking is not necessarily better.

The reliance on data infrastructures, with an increased number of users and systems depending on them for policy decisions, has raised concerns about privacy and excessive surveillance of vulnerable populations. The anti-poverty agenda, in particular, has placed a strong emphasis on data-driven social assistance programmes, leading to an overrepresentation of 'the poor' in data infrastructures. Data on poor populations are seen as essential for the identification and selection of beneficiaries of targeted social protection. Social registries,[i] often combined with nationwide household surveys, are used to model poverty profiles, create proxy-means tests (when means-tests are too expensive or not available), and sort the population between deserving and undeserving social protection targeted variants, such as conditional cash transfers.[ii] These registries are the most widely used data infrastructure for allocating social benefits in the Global South, following the push of international financial institutions that have disseminated their use together with the funding of social assistance schemes.

The use of social registries implies that poor populations are disproportionately surveyed to be recorded and classified using welfare and poverty metrics. Over the last two decades, we have seen an exponential growth of micro-data on 'the poor' as epitomised in the field 'Poor Economics' (Duflo & Banerjee, 2011). While this has made poverty 'visible' to policy policymakers, it also speaks of a technocratic shift in social protection, rendering poverty as a technical problem. Poor populations' visibility in records, cadastres and registries determines their visibility and eligibility for social protection. Welfare offices scoop up records from vital statistics, social security records, health services, or else to verify the poverty of target populations who rely on social assistance and exclude those 'underserving'.

Furthermore, the design of social registries tends to assume that the poor are geographically concentrated in peripheral areas, which are purposively selected when fielding the surveys. While making some vulnerable populations visible to the state, this geographical targeting can also amplify the spatial segregation of social policies, rendering invisible other forms of poverty and precarity present in what are considered better-off areas. For instance, vulnerable populations that are part of care circuits or the construction sector often reside at the site of work and might be excluded from social registries that skip wealthier areas. Thus, data-driven

social assistance carries two seemingly contradictory weaknesses: some marginalised and minoritized groups are missing from the data, while others are oversampled and kept under surveillance to check for changes in their socioeconomic status and eligibility.

This paper problematises the use of automated systems that classify the population into poor and non-poor to allocate social assistance benefits. It does so by scrutinising and contextualising what goes into the data infrastructures, to understand what comes out: ordering systems such as proxy-means tests. The paper fleshes out the messiness in fielding social registries and producing poverty metrics to determine eligibility for social assistance. The analysis looks at the data infrastructures, poverty estimation models and institutional architectures that bring targeting into force. The first section introduces the shift towards targeted modalities of social protection and the uses of social registries and proxy-means tests to identify and select beneficiaries. The second section introduces the Ecuadorian case, the adoption and expansion social assistance, and the first attempts to operationalise data-driven programmes. After presenting the methodology, the third section considers the context to situate the analysis and flesh out how data on 'the poor' are messy. It examines data collection not as neutral but as the product of unequal social relations, which are captured through ethnographic work conducted in southern Ecuador. This section looks at what goes into the social registries. The fourth discusses what comes out or the process of gathering the data in social registries, the estimation of poverty metrics and welfare indices to sort the population, and the decisions to establish thresholds that effectively translate into inclusion or exclusion from social assistance. The fifth section concludes with a discussion of how power is deployed through data in technocratic approaches to social protection.

1. Sorting the poor: the use of social registries in social protection

Conditional cash transfers are regarded as a 'radical' new idea conceived in the South (Hanlon, et al., 2010). Their design is appealing because of its simplicity: a target population—usually poor mothers with school-age children—receives a periodical stipend subject to conditions related to human capital investments, for example, taking the children to school and medical check-ups. These programmes have marked a transition towards individualised and targeted social protection interventions. Fostering an experimental ethos claimed to be insulated from politics, the conditional cash transfer model encapsulates a different rationale. A model first explored at a small scale in Chile in 1982 (Lavinas, 2014) and pioneered at a national level in Mexico and Brazil in the early 1990s (Cecchini & Madariaga, 2011), cash transfers have been

replicated in many low- and middle-income countries and increasingly in high-income countries. As the cash transfer model has been disseminated to other geographies (Peck & Theodore, 2015), the objectives now going beyond income support (Molyneux, et al., 2016).

Although now inserted in national social protection systems and adapted to their varying needs, the cash transfer model (Peck & Theodore, 2015) has kept its foundational ideas: supplying targeted income support while introducing behavioural changes. Initially, these programmes were conceived as limited interventions, designed to prevent the poor 'from falling through the cracks' while affecting production and investment decisions with the ultimate objective of securing a permanent way out of poverty, i.e., graduation. At first, the emphasis on exit or graduation responded to constraints related to external conditions, e.g., donor support, or pressure on social assistance budgets (Barrientos, 2019). Nonetheless, most programmes are still in place after more than two decades of their first appearance in the Latin American region. Cash transfers have been increasingly embedded within government structures (Barrientos, 2019), resulting in the creation of ministries and agencies to manage these programmes, registries, and associated delivery systems.

The process of identification and selection of beneficiaries is usually managed centrally and technically. Entitlements channelled via cash transfers are provisional: they target the poorest who appear in social registries and sorted by instruments such as proxy-means tests. For citizens to remain eligible for these benefits, a series of conditions must be met, e.g., income poverty, motherhood, old age, or disability—and often, specific behaviour is expected, e.g., taking children to medical check-ups. Once these conditions are no longer in place, the benefit provided through cash transfers ceases, in what Devereux and Sabates-Wheeler denote as 'endogenous exit' whereby 'programmes deliver benefits until participants reach a predefined threshold on key indicators that make them no longer eligible to receive benefits' (2015, p. 3).

For this reason, the design and management of social registries is preoccupied with streamlining procedures, optimisation of targeting (Brown, et al., 2018), accuracy, data quality and integrity of social registries, and the integration of technology for the selection of beneficiaries, e.g., biometrics (Gelb & Decker, 2012). Technology and data infrastructures can improve targeting while reducing patronage and corrupt practices (Ballard, 2013).

Governments devote attention to improving data infrastructures and invest in technology innovation to help find the poorest populations by employing more accurate data collection, mathematical modelling and estimations of poverty lines and cut-off points. Nonetheless, blind

reliance on technocratic policymaking is dangerous. The process of targeting is prone to exclusion errors (Brown, et al., 2018; Kidd and Athias, 2020). Minor errors, gaps and omissions in social registries and poverty estimates can lead to significant biases in access to social benefits channelled through these programmes. Furthermore, cash transfers can further institutionalise micro-power technologies concerned with moral individualism (Wacquant, 2009) as they are implemented through rigid protocols that govern the recognition of social rights as a reward for 'good behaviour'. Data thus provide the basis for governing poor populations, for after enumerating them, they are made legible to the state for sorting.

Social registries are designed to fill the gap in information about the poor, particularly in highly informal settings where vulnerable informal populations are missing from administrative records, e.g., social security. To collect specific data on less visible populations, registries rely on national household survey data to estimate poverty and map it onto census data, thus assigning a poverty profile to specific areas surveyed and included in these registries. However, such geographically based enumeration tools are not perfect. Social registries might miss important information on the lived experiences of and conditions that perpetuate poverty. First, they tend to assume a correct underlying order, e.g., households or nuclear families as fixed units. Such enumeration techniques, mainly when surveys are sparsely fielded, cannot adapt to the fluidity of social life, including livelihoods strategies, informal care networks or demographic changes within households. Since they focus on the residence and the household as the unit of analysis, they are likely to miss atypical households, displaced or homeless populations, migrants, new-borns, or highly mobile informal workers. Furthermore, because the social registries are extensive statistical operations, costly and time-consuming, they are fielded every five years or so, unable to capture seasonal changes in poverty or residency.

Second, the overly elaborated mathematical models applied to the data on the poor can be seen as a hiding trick. For the average citizen, proxy-means tests, the most popular targeting tool used to select cash transfer recipients, are difficult to decode. It requires a high level of statistical literacy to make sense of the mathematical models used. Poor populations are often confronted with complex data protocols and cryptic thresholds and cannot decode the procedures and technicalities that determine their eligibility for social assistance. Third, eligibility protocols mimic a bureaucracy that mechanically implements rules, void of empathy elements. The political identities of recipients are more challenging to locate in these opaque protocols, limiting the space for recognition, solidarity or resulting in contradictory claims (Moore, 2019).

As a result, social registries, though necessary for selecting cash transfer beneficiaries, standardise poor populations into differently situated subjects of development: deserving and undeserving. Fischer (2018) flags how the identification of poor populations for targeting, and processes of social stratification, work jointly to confirm individuals' marginal place in society. This is particularly relevant for studying social protection systems in Latin America, as social stratification could be regarded as a broader institutional feature. These systems were exclusionary by design, including only a limited number of right-bearing citizens, primarily male workers in urban centres (Molyneux, 2006). Despite a series of reforms to make social protection systems more inclusive, the region is still characterised by bifurcated systems that grant work-related entitlements to right-bearing citizens, e.g., contributory social security, in co-existence with individually targeted social assistance programmes for the poor (Lavinas, 2015). This bifurcation carries both symbolic and material weight, with social assistance considered anti-poverty (Hanna & Olken, 2018; Lavinas, 2015), a distinct category that reveals how poverty is managed as a social problem to be fixed, something to overcome, technically.

2. The incubation of data-driven social assistance in Ecuador

The end of the 1990s marked a new moment in social protection in Ecuador. A series of mobilisations followed the erosion of economic and social rights that resulted from the financial crisis in 1999. The first cash transfer programme Bono Solidario (or BS) was created in this context. The BS was introduced to compensate poor and informal sector workers for eliminating the subsidy on cooking gas. The BS programme started as an unconditional transfer and was meant to be temporary (Schady and Rosero, 2008). To remain eligible, neither the beneficiary mother nor her spouse could be in regular (formal) employment (Martínez et al., 2017). At first, households signed up on a first-come, first-served basis. Information on household composition and income levels was self-reported in local parish churches (Kingman Garcés, 2002). By 2001, the administration developed a survey to estimate a proxy-means test. Most families living in rural areas and some of the more deprived urban areas were surveyed and included in the social registry. Beca Escolar (BE, or School Grant), an addition to BS, was implemented in 2002. Designed as a conditional cash transfer programme, the BE aimed at preventing school dropout amongst the poor. In 2003, the BS and BE were merged into a conditional scheme, Bono de Desarrollo Humano. The creation of BDH was accompanied by a retargeting of the recipient population using SELBEN, a new proxy-means test estimated from a national household survey. Education and health conditionalities, in Spanish

corresponsabilidades, framed beneficiary mothers with underage children as co-partners in this intervention.

Because of this categorical and geographical targeting, women, many of them of historically underrepresented groups, were included in the BDH scheme. Social assistance permitted the extension of social protection to marginalised populations. Before the shift towards targeted social assistance, contributory social insurance in Ecuador only covered formally registered employment, concentrated among male mestizo urban populations. Social protection transitioned not from a complete but stratified universalism towards targeted assistance. This might explain the little resistance to implementing an even more segmented and differentiated system, probably due to the pre-existing segmentation of social protection, deep-seated racial segregation in the labour market (Author, 2019), and ongoing processes of informalisation and precariousness of employment.

Ecuador joined an 'inclusive' turn in 2007 when President Correa came to power. This marked the adoption of a new development agenda that aspired social inclusion through intensified public investment. Also, in 2007, cash transfers for the elderly and disabled were levelled up to meet the conditional component of the Bono de Desarrollo Humano[iii] (BDH) targeted to mothers, to an amount of US$30 per month—increased to US$35 in 2009 and US$50 in 2012. Whereas benefits targeted to the elderly and people with disabilities and their carers within their families increased both in size and coverage during Correa's administration, benefits targeted to families with dependent children, after a period of rapid expansion from 2007 until 2012, decreased dramatically by the end of Correa's administration. Starting in 2013, the number of beneficiary households reduced from 1.2 million in 2012 to 430 thousand in 2016 (MIES, 2018).

The transfer had been maintained at US$50 per household until the end of 2017, when until former President Moreno increased the transfer by National Decree 253 to a maximum of US$150 per household, conditional on the number of dependent children: US$ 30 for the first child aged 0 to 5 years, US$27 for the second child aged 0 to 5 years and US$24.30 for the third child aged 0 to 5 years, next to US$10 for the first child between 5 and 18 years old, US$9 for the second child between 5 and 18 years old, and US$8.10 for the third child between 5 and 18 years old; for a maximum of three children covered under the new variable scheme. Though the benefits increased, the programme included a markedly lower number of households: 412

thousand (MIES, 2018). The process of exogenous graduation continued driven by changes in poverty as recorded in official data infrastructures.

Such poverty changes are recorded in the *Registro Social* or Social Registry, the database used to identify and select poor households, which determines eligibility for BDH transfers. Compiled by the Ministry of Economic and Social Inclusion (MIES or Ministerio de Inclusión Económica y Social), it contains information on socioeconomic variables, education and employment, and demographic characteristics of all household members living in areas deemed as vulnerable. As the social register used for selecting beneficiaries in Ecuador is collected every five years or more (World Bank, 2019), there is a high probability of attrition of the sample, exclusion due to changes in poverty estimates, next to low flexibility to include new recipients, re-entering or adjusting household data (Buser, et al., 2017).

3. Context matters: what goes in

The methodological approach actively centres the voices of those who are directly impacted by the outcomes of the data infrastructures. This approach also aims to go beyond quantitative vs qualitative binaries in the study of social protection programmes, with the former dominating the study of cash transfers, e.g., impact evaluations. By bringing qualitative work, the paper explores and analyses what is missing from the social registries and the elements of poverty they purport to represent capture. The qualitative work produced counter-data that is used to analyse possible biases and omissions in social registries, while it captures aspects of social life that are not enumerated because lack of social awareness, or even structural disregard.

More than 30 in-depth interviews were conducted in the cities of Loja and Machala in southern Ecuador with household family carers, former and current BDH beneficiaries aged between 19 and 70 years: mothers, grandmothers; daughters and daughters-in-law. Interviews consisted of open-ended questions and conversations—at all times, participants were informed about the interaction with the author as part of a research project.[iv] Interviews took place in a few home visits but mostly in public spaces such as health centres and open markets. The author also engaged in everyday conversations and informal observations of routine activities and took notes of all the tacit information as it emerged in the field. This fieldwork data is complemented by interviews with policymakers, programme officers, and consultants involved in identifying and selecting BDH beneficiaries. Such interviews were conducted online over 2020 and 2021, and located key informants at the URS, Senplades and the World Bank, that contributed to the

research anonymously and were refereed using a snowballing method. The qualitative work also involved documentary research of policy documents, official records, and reports on the BDH in Ecuador. The analysis of procedural aspects related to targeting is set to unveil how 'power enables as much as it constrains or coerces' (Li, 2007, p. 25) through the granular and technical management of cash transfers.

Interviews conducted in Loja and Machala, in southern Ecuador, benefited from a natural experiment. In 2013, when the field research had started, the process of exogenous graduation, i.e., delisting from BDH, described in section three, was underway. However, it had not been officially unannounced as of yet. There is insufficient communication with (former) beneficiaries about changes in their eligibility. This is usually communicated after the decision has been taken. Most interviewees did not know that they had been graduated and would stop receiving transfers until they reached an ATM and got an error message. Some had been notified that they would no longer participate in the programme, as they had learned it from an automated response received as a text message on their mobile phones, which stated: '*otros lo necesitan más*, or others need it the most'. In response to this process, graduated, or rather, delisted beneficiaries, making use of different channels to understand graduation and even challenge it.

There is a widespread belief that there is no need to fully disclose the targeting criteria and protocols used to select beneficiaries because that would trigger moral hazard among the target population (Schady & Rosero, 2007). The moral subtext of such a bureaucratic decision being that poor mothers allegedly have incentives to trick the system because they are 'morally deficient', e.g., irresponsible. The opaque character of the protocol that determines eligibility for the programme makes it authoritative. This lack of clarity quickly turns into silent consent, forcing populations to accept a process of graduation based on a protocol too complex to decode. This observation is corroborated in a recent World Bank report which, although advocating for the need to depurate the BDH database to delist or graduate beneficiaries, flags the lack of transparency and accountability in such process (MIES and Banco Mundial, 2019). The eligibility protocol is not accessible to the target population, which damages trust in the programme itself.

These hurdles, however, do not bring all poor populations efforts to make themselves eligible to a halt. In an uncertain scenario, populations that consider themselves in the target population activate what they think are valid elements that render them visible and could be enumerated

as poor in the social registry. It is known to beneficiaries that certain items, e.g., iron, access to electricity, legalisation of assets (e.g., landholdings or *lotes* as referred to in the quote below), or financial inclusion, have a significant weight in the edibility protocol.

> 'I legalised the lote [landholding] where I was living, I guess that is why I do not get any BDH money no more […] I insisted, visited the MIES offices on three occasions, but they did not give me a clear answer. I guess it is because of this lote. But I live in a one-room house, together with my daughters […] see, they are single mothers, too.' (Interviewee-P. Former BDH recipient. Occupation: street vendor and occasional agricultural worker) (30 April 2013).

The lack of transparency in terms of eligibility gives the impression that participation in the programme is a lottery. This impression seems justified, as the BDH has been treated as a game of chance in impact evaluation studies (Buser, et al., 2013), though that might be informed by a theoretical approach that considers transfers non-labour income aligned to a logic of probability. During interviews, beneficiaries seemed clear about eventual graduation, aware that their permanence in the programme was temporary. Nevertheless, they could not decode the eligibility criteria that enabled their participation or would lead to their graduation. The programme is marked by uncertainty and speculation as there is only limited information about who is eligible and why.

> 'I have heard that the BDH for mothers, either single or married, will end. They will only give it to the disabled and the elderly' (Interviewee-V, female BDH recipient. Unemployed; usual occupation: domestic worker) (14 May 2013).

With the many changes to the targeting criteria implemented since the programme's creation, beneficiaries hardly expressed a sense of entitlement. The interviews were plagued by feelings of insecurity and mistrust linked to individualised processes of data collection and emphasis on technicalities when interacting with front-line workers and public officers:

> 'We wanted to apply, but they [MIES officers] asked me to bring two carnets: the cédula (or citizen identification document), and the one they give you as a disabled person. I did not have those things. See, they did not register my name. They go and offer things, but in the end, nothing happens for us. They will tell you "come back later", but then when we came back nothing!' (Interviewee-H, 2013. Non-recipient elderly female, occupation: street vendor) (19 April 2013).

It is difficult to distinguish the effects of targeting from broader power structures and social relations. The social registry comes into being through a complex web of relationships between citizens and state practices. In observing the procedural workings of the state in particular sites, such as the local MIES office, the detrimental aspects of individualisation are noticeable. If former beneficiaries would like to file a rebuttal, they would need to invest time to mobilise political and economic resources—which marginalised populations often lack. Furthermore, the distance between technocrats and claimants, which keeps the protocol inaccessible as an automated technical process, offers no room for revaluation of personal circumstances. Instead, it generates distrust. Not all beneficiaries seemed equally convinced about the conditional (or *corresponsabilidades*) element of the programme, for instance:

> 'They [MIES administration] do not ask what the money is for. They do not care. They think they get to know us with a survey […] they asked me what I used the money for […] I just gave them any answer and signed a document; I do not know what for.' (Interviewee-S. Female BDH recipient. Unemployed; usual occupation: domestic worker) (14 May 2013).

The BDH programme is not openly punitive: there is no monitoring of the conditionalities in practice (Buitron, 2015). Still, discursively, beneficiaries receive the BDH money for good behaviour and the correction of what is regarded as 'morally deficient' behaviour, e.g., underinvestment in children's schooling, poor health practices, and they seem aware of this disciplining role of social assistance or have internalised such norms. Even if the transfer would appear unconditional after enrolment, few women see themselves as the rightful claimants of benefits, because of it is tied to the condition of motherhood and poverty.

Even when the eligibility criteria have been met, issues of geographical distance hinder people's chances of participating in the programme:

> 'They came to interview us in 2008. They talked to my husband. I tried telling them my husband was sick. Still, they removed me from the programme. The month after, I went to withdraw my BDH money, and I was told I would not receive BDH transfers anymore. … I have tried signing up again for BDH transfers, told them he is disabled. But the answer is always no because he receives an IESS pension. When I visited MIES, I was told they do not include new people in the register. But people keep on telling me that I should go back and insist.' (Interviewee-B, 2013).

The BDH programme seems to have rescaled the recognition of social rights down to individuals that can prove to inhabit in households recorded as poor and in areas deemed as poor—yet accessible to surveyors. The identification of poverty is activated via a single thread connecting potential beneficiary households with the state. This individualisation is evident in locations at the margin who have not known the possibility of social protection separated from their condition of poverty. Beneficiaries did not seem to have a collective experience of entitlement. To this aspect of individualisation, the transient nature of the BDH adds layers of mistrust, risk, and uncertainty, as it feeds into the fear of losing the visibility gained.

It is plausible that historical processes of exclusion have contributed to transferring the responsibility away from the institutional sphere and downscaled at the level of individuals. Those beneficiaries who do not see themselves as claimant of rights could be both, a consequence of processes of marginalisation sedimented in a highly unequal society, and exacerbated by this particular type of intervention, individualised and technical. Targeted modalities of social protection[v] require the poor to provide legible proof of their condition periodically. Both excessive surveillance of poor populations through statistical tools and the inability to record the fluidity of social life expose the normative aspect of sorting, worsening feelings of unreservedness. Social registries remain limited in capturing dynamic aspects of poverty and questioning the validity of the data and what might be missing from the corpus used for estimating poverty and selecting beneficiaries, as discussed in the following section.

4. The eligibility protocol: what comes out

This section discusses the eligibility protocol used to sort the eligible population and determine who effectively receive BDH transfers. The programme uses a proxy-means test or PMT, which is regarded as a 'shortcut to full means test' (McBride and Nichols, 2018, pp. 531) or where full means tests are costly. PMTs were first developed in Latin America during the 1980s. Such eligibility or targeting tools are 'developed by assignment of weights, or parameters, to several easily verifiable household characteristics via either regression or principal component analysis (PCA) in an available, nationally representative data set' (ibid). Once a PMT tool has been developed using this method from a population sample, it can be applied to the target population to classify or sort the households and/or individuals according to the PMT score, that is, above or below a poverty threshold. The PMT tool uses historical data on households and can be used not only within the sample in which they were parameterised but within a new data or sample, that is, the social registry. For such a purpose,

out-of-sample prediction is crucial (p. 532). Recent developments in poverty targeting using PMTs have led to increased machine learning as a more precise retool mechanism to map poverty onto social registries.

Since 2019,[vi] the Social Registry Unit (URS or Unidad de Registro Social) is the institution 'with powers of coordination, management, monitoring and evaluation' of the social registry in Ecuador. It is responsible for administering, updating and maintaining the social registry. This registry is the primary technical tool for allocating social protection policies and programs and state subsidies. On 22 July 2019, the Ecuadorian state and the BIRF signed the BIRF 8946-EC to partly fund the Social Protection Network Project or Proyecto Red de Protección Social (MIES and Banco Mundial, 2019). One of the main objectives of this loan is to keep the information in the social registry database updated and increase the quality, timeliness, relevance, and availability of the information entered into the registry.

The regression approach to the PMT tool was used in Ecuador until the 2013-2014 social registry and associated poverty metric or IRS2014 estimated using Principal Component Analysis or PCA. Such an approach requires practitioners to select the household characteristics that account for the variation in the dependent variable, e.g., poverty. The data infrastructure of the IRS2014 had two clear advantages, according to a former Senplades data analyst (Online interview, 2021). First, the last national census had been fielded recently (as of 2010) which increased the accuracy of the geographical targeting. Poverty maps use household data to estimate poverty by mapping the modelled poverty onto census data and assigning a poverty profile to each household. However, census data are available only once a decade. Although population censuses are designed to represent all individuals at the time of the data collection, they can leave out some of the poorest and most vulnerable. Many vulnerable groups are hard to count in the first place, particularly when enumeration focuses on the residence and the concept of the household.

Second, the social registry was fielded using mobile devices and geolocation. The targeting process could then make use of this granular information to map and locate poor households. The selection of areas to be included in the social registry followed two criteria: a high number of BDH recipients and the levels of structural poverty, that is, the unmet basic needs metric or NBI (Necesidades Básicas Insatisfechas). This was a significant improvement in data collection, if compared to the IRS2008 that was collected using paper questionnaires. This also offered efficiency gains: within 15 days, data on households could be 'cleaned' and verified.

Nevertheless, the IS2014 had a significant weakness: it used PCA to estimate the poverty index, as mentioned by key informants. This tool led to some confusion in terms of the weights assigned to the variables. For example, both the target population and practitioners realised that the possession of iron or the household having an electric meter weighed significantly in the PCA estimated poverty metric, leading to (wrongly) assuming that such possessions determined eligibility. In practice, it was the combination of various items and conditions that led to inclusion or exclusion from the programme.

The index developed four years later: IRS2018, tried to amend the targeting errors of the IRS2014, attributed to the use of PCA and experimented with machine learning to estimate poverty out-of-sample, that is, from the ECV[vii] (Encuesta de Condiciones de Vida or Living Conditions Survey) onto the social registry. With the adoption of machine learning tools, the mathematical model used to estimate the poverty index also changed[viii] and thus, the population eligible for social assistance. The most significant advantage that practitioners (from various organisations such as the URS, Senplades and the World Bank) flagged was that machine learning techniques do not assign weights to the variables, unlike PCA, or estimate a proxy of poverty consumption. Instead, the model (re)weighed the variables after multiple tests, learning to adjust to multidimensional poverty indicators using neuronal networks, a novel technological step that allowed to replicate poverty according to the ECV2014 (as mentioned by both Senplades and World Bank key informants, 2020-21). This was a substantial improvement in the poverty estimation methodology and seemed to allow practitioners to reduce inclusion and exclusion errors. Concerns about moral hazard also motivate machine learning algorithms that assign more weight to household characteristics less likely to manipulation.

Still, the corpus of data was not updated, and despite the advanced targeting tool, the process was plagued with difficulties. First, there were problems with the data collection and fielding of the new social registry in 2018. The 2016 earthquake in the northwest of Ecuador had changed the landscape and living conditions in the most affected areas. The disaster also led to internal displacement, particularly among vulnerable populations, who had changed the location registered in the 2010 census and prioritised areas and households to be surveyed. In addition to this, it should be noted that eight years had passed since the last census. The geographical targeting mechanism used to prioritise the areas to be included in the registry was obsolete. As a result, though machine learning was regarded as an improvement in terms of the poverty estimation methodology, the data onto which it was applied was problematic. There

are errors and omissions in the IRS2018 that are carried from the sample. As the PMT is applied to the collected sample, it cannot correct mistakes, omissions, and biases during the data collection process, such as the problems with geographical targeting or obsolete census data. That means that the algorithm could not only replicate but amplify omission errors and biases.

Furthermore, practitioners flagged little observance of the data collection schedule: the ECVs are not always collected promptly, nor the poverty index updated timely and consistently. There are short-term updates of the social registry but only to revise the list of beneficiaries and verify their conditions, e.g., merging data with the Civil Registry to document deaths. Nevertheless, these updates do not lead to a change in the metric. Moreover, though officers evaluate elements of the social assistance programme and even apply the same questionnaire to some households, there is no clear graduation strategy. For practitioners, this opaque graduation protocol is problematic, as there is a segment of the population perceives the BDH as an entitlement—whereas they insist on its temporary nature. Furthermore, there is no clear strategy to collect beneficiaries' data and determine structural changes in their poverty level.

Still, the URS is aware that the demographic situation of households changes over time. According to its norms and regulations, a new social registry should be fielded every six years and updated every 24 months to account for these changes. With each social registry data collection wave, a new poverty metric is calculated, thus leading to a change in the eligibility protocol. However, fielding a new social registry survey is not always possible. These statistical instruments are extensive and time-consuming because the samples tend to be relatively small, seldom designed to have validity out-of-sample.

To navigate the messiness in data collection, machine learning was developed as a domestic initiative that could use innovative techniques available to deal with incomplete registries. Senplades (Secretaría Nacional de Planificación y Desarrollo or National Secretary for Planning and Development) intended to implement this new method but instead hired an expert that would eventually be part of the World Bank team advising the URS in the improvement of the social registry. With the involvement of the World Bank, there was a further demarcation of responsibilities, with the recognition of the URS as a separate sorting unit. This was intended to tackle what was mentioned by practitioners as a common misunderstanding about the reach of the social registry. As various key informant interviewees mentioned, the social registry should be seen as a stratification instrument and not a census proper. Such remark is essential, as the social registry proved ineffective to supply timely and complete information during the

Covid-19 pandemic. The pandemic posed a significant challenge for the social registry (author, forthcoming), as populations in informality were only visible in the social registry and missing from administrative records—workers in informality do not appear in these records. However, many were also missing in the social registry, as their condition of precarity forces them to move, or to reside in areas not deemed as poor, as mentioned earlier.

In sum, key informants signalled problems with the quality and accuracy of the social registry and its associated poverty metric. Issues such as lack of granularity, low accuracy, and limited comparability across waves result in fragmented and even contradictory policy efforts, despite the seemingly genuine efforts to improve the data infrastructures. Missing data and omissions then have real consequences regarding protection and can further disenfranchise vulnerable populations during periods marked by risk and uncertainty.

5. Conclusion

Recent years have witnessed emerging critical research dealing with the normative aspects of social assistance. It is, therefore, a timely and essential task to engage with this critique. This article adds to that emerging field by questioning the role of data-driven social assistance in deepening the process of exclusion through targeted modalities. This critique is essential given the rapid pace dissemination of narrowly targeted modalities of social protection that has taken place over the last two decades. There are evident challenges in providing social assistance in contexts marked by deep-rooted socioeconomic inequities, poor data infrastructures, incomplete administrative records, high levels of informality, which could deepen processes of exclusion and marginalisation. The use of data for social assistance in such contexts invites a critical engagement and healthy scepticism regarding modelling techniques and data infrastructures.

Cash transfers have supported material improvements in the living conditions of recipient households, extending rights to otherwise marginalised populations: women, elderly and people with disabilities. Though aware of such material gains, this article has problematised the normative aspects that inform the technical management of poverty and the related social processes that they regulate and govern, as targeting inevitably results in a system of exclusion. How to square this technocratic and fallible approach with the promises of rights-based development? Rights-based development is concerned with 'universality, equality and non-discrimination, participation, access to information and accountability' (Sepúlveda Carmona, 2014, p. 8). As cash transfers favour targeting, discriminating between deserving and

undeserving, and hurdles to accountability and access to information related to the targeting process, the values central to right-based development differ from the practices. This article has shown how the limitations to fully decode eligibility and graduation protocols go against the operational principle or transparency associated with rights-based development, which indicates that access to information should be easy to grasp and regularly revealed. Cash transfers are technical instruments poorly aligned to the logic of rights.

Social registries amplify biased historical data on the poor, which might be in the form of reported assets, difficulties in capturing informal care networks, seasonal work, demographic changes or less visible forms of precarity. Despite the use of rigorous modelling techniques, how can policymakers ensure that past inequalities are not distilled into black-boxed eligibility protocols? For instance, social registries cannot see that informal care networks running across households are not incidental. The emphasis seems to lie on surveillance instead of protection, mainly aiming at speeding up the exclusion of the 'undeserving'.

Furthermore, experts tasked with creating poverty profiles often exclude de political-economic relations from their diagnoses, that is, 'the practices through which one social group impoverishes the other' (Li, 200-7, pp. 7). This inability to 'see' should not take us to rush in pointing at hidden motives or a perverse agenda accruing to practitioners. The adoption of technocratic policies emerges within a particular approach to poverty that assembles diagnoses, techniques, and solutions available to the expert trained to render things' technical'. As mentioned by Peck and Theodore, the 'aura of scientism that pervades … evidence-based policymaking … secures the expert status of model architects, advocates and evaluators' (p. 108). By positioning the expert as the trustee with the capacity to diagnose societal problems, such as poverty, and vulnerable populations at the other end as subjects to the expert assessment, quantification creates a technology of distance. The technicalities in targeting form a literal space between poor populations and the knowledge produced about them, a knowledge that functions as a form of authority void of empathy and unable to see the fluidity of social life.

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[i] Social registries record households' ownership of durable goods, housing quality, persons per room, educational levels and other variables used to estimate proxy-means tests. In many countries, these registries are regarded as 'poverty censuses' as they over sample areas deemed as poor.

[ii] Cash transfers are only a subset of social protection. They are better classified under social protection with conditions (Fischer, 2018). Social security systems and labour regulation, are the other two components of social protection.

[iii] In 1998, Bono Solidario was created to compensate poor households for the elimination of a subsidy on cooking gas. The programme was publicly known as Bono de la Pobreza (Poverty Grant). Beca Escolar (BE, or School Grant), an addition to BS, was implemented in 2002. Designed as a conditional cash transfer programme, the BE aimed at preventing school dropout amongst the poor. In 2003, the BS and BE were merged into a conditional scheme, Bono de Desarrollo Humano, aimed at reducing inequality, increasing access to social services, providing income support and working towards a general objective of social inclusion.

[iv] [iv] Doing research 'at home' delivered clear benefits: the author new context, the language, and local customs. But it also brought about tensions: there was a level of performance in respondents' communication as these are populations often surveyed by social workers and academics given the emphasis on data-driven policy central to this piece.

[v] This article is limited to studying social protection concerning the developments in terms of social assistance, consequently missing a comparative analysis of the social security system and embedding in social protection systems. It should also be noted that not only selection and delivery systems but also financing (via taxes and contributions) help to understand the political economy of social protection as well as the institutional practices associated to the recognition of rights (Fischer 2018), another perspective that is not centrally addressed in this article.

[vi] Created by Executive Decree No. 712 of April 11, 2019

[vii] The ECV is used to estimate the level of consumption poverty at the national level. The syntax for the poverty estimate considers a consumption aggregate of both food and non-food expenditures. For food expenditures, it considers all items that each household member consumed in the month prior to the survey. The non-food consumption considers expenditures on durable goods, education, basic services (utilities), and other non-food expenditures of the household in the same period.

[viii] The IRS2018 ranks households with values between 0 and 100. After applying the mathematical model, poverty threshold was established in 5.73848 for extreme poverty and 25.83095 for poverty. Since the new thresholds excluded a significant number of recipients in condition of extreme poverty, the URS established the new cut-off points in 8.89208 and 29.77402, for extreme poverty and poverty, respectively (according to the official report URS-DEJ-2019-0154-O).