Digital Divide in Access to Government Services: Evidence from a Large-Scale Field Experiment

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Extended Abstract

Governments are increasingly moving public services online and phasing out traditional service channels such as paper applications and phone support. While these reforms are often justified on efficiency grounds (Layne and Lee, 2001; Marc et al., 2022; Norris and Moon, 2005; Tokovska et al., 2023), they may further increase inequalities by excluding citizens with limited internet access, low digital literacy, or distrust in online services. Prior research has largely focused on how citizens choose between different service channels (Madsen and Kræmmergaard, 2016; Pieterson and van Dijk, 2007; Teerling and Pieterson, 2011) or on how governments can encourage the use of digital channels (Hanmer et al., 2015; John and Blume, 2017; Madsen and Kræmmergaard, 2018; Teerling and Pieterson, 2010). Yet, little is known about the consequences of removing traditional channels for accessing government services altogether.

We take steps to fill this gap with a large-scale natural field experiment conducted in collaboration with a social insurance office in Switzerland. One of their primary responsibilities is the distribution of health insurance subsidies to roughly 30% of the population amounting to about USD 2,500 per eligible household per year. In the past, households received both a paper and an online application from the office.

The office decided to discontinue the distribution of paper application forms by default and, instead, to mail only the information needed to access the online application ("Online-Only" condition). Paper applications remained possible; however, households had to explicitly request them

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from the office. To enable an evaluation of this policy change, we negotiated a phased rollout involving 285,000 eligible tax households. In this design, the status quo—distribution of both paper and online application materials ("Paper & Online" condition)—was preserved for a randomly selected subset of households for one additional subsidy year. This experimental design allows us to identify the causal effect of discontinuing the default provision of the traditional paper channel on subsidy take-up.

We find that removing the paper form from the mailing reduced overall applications by 3.4 percentage points. In the Paper & Online group, 39.6% of households applied online and 18.7% applied on paper, for a total take-up of 58.3%. In the Online-Only condition, take-up fell to 54.9%. To understand this decline, we focus on the 18.7% of households who used the paper form when it was automatically provided. Assuming that households who applied online in the Paper & Online condition would continue to do so in the Online-Only, we decompose the 18.7% of households who used the paper form in the Paper & Online condition to examine how they respond when the paper form was no longer provided by default. Among these households, 7.1 percentage points switched to applying online, 8.2 percentage points went the extra mile to request a paper form, and 3.4 percentage points did not apply at all. Thus, while many households were able to adapt, removing the default paper channel also led to a non-negligible share being left behind.

The literature on the digital divide suggests that older people are increasingly adopting online services (Friemel, 2016; Pew Reseach Center, 2017). However, they often depend on assistance from others (Helsper and Reisdorf, 2017; König and Seifert, 2020), struggle with continued use (Heponiemi et al., 2024), and sometimes feel coerced into digital-only services (Pirhonen et al., 2020). We therefore explore heterogeneities across age groups and find substantially stronger effects among household heads aged 65 and older: Discontinuing the paper form reduced the applications by 8.9 percentage points relative to the Paper & Online condition. However, even younger adults (aged 26–35) experienced a significant decline of 2.8 percentage points. This could suggest that even younger cohorts may face exclusion due to gaps in basic digital skills (Hecker et al., 2021) or mistrust in digital government services (Barroca, Jean Gil and Kishnani, Pankaj, 2023), mechanisms that we examine next.

To construct a proxy for trust in digital government services, we use recent referendum data in which the Swiss public voted on the introduction of a government-administered electronic identification system ("e-ID"). We match municipality-level voting outcomes to our data using zip codes and find that households in areas with higher support for the e-ID system exhibit a significantly

smaller reduction in take-up than households in more distrusting areas. These results are consistent with the interpretation that digital trust operates as a behavioral channel through which the removal of traditional service options affects take-up.

Overall, our findings show that online-first reforms can inadvertently restrict access to essential public services when inequalities in digital skills and digital trust affect households' ability to navigate online systems. In our setting, households could still request a paper application, suggesting our effects likely represent a lower bound. In contexts where traditional channels are fully eliminated or more costly to access, the exclusionary effects of digitalization may be even more pronounced.

References

Barroca, Jean Gil and Kishnani, Pankaj (2023). Three ways people aged 55 and above access digital government services differently from those between 18 and 34. Technical report, Deloitte Insights.

Friemel, T. N. (2016). The digital divide has grown old: Determinants of a digital divide among seniors. *New Media & Society 18*(2), 313–331.

Hanmer, M., P. S. Herrnson, and C. Smith (2015). The Impact of E-mail on the Use of New Convenience Voting Methods and Turnout by Overseas Voters: A Field Experiment to Address Their Challenges with New Technology. *Election Law Journal: Rules, Politics, and Policy 14*(2), 97–110.

Hecker, I., S. Spaulding, and D. Kuehn (2021). Digital Skills and Older Workers: Supporting Success in Training and Employment in the Digital World. Technical report, Urban Institute.

Helsper, E. J. and B. C. Reisdorf (2017). The emergence of a "digital underclass" in Great Britain and Sweden: Changing reasons for digital exclusion. *New Media & Society 19*(8), 1253–1270.

Heponiemi, T., L. Virtanen, A.-M. Kaihlanen, E. Kainiemi Päivikki Koponen, and S. Koskinen (2024). Use and changes in the use of the Internet for obtaining services among older adults during the COVID-19 pandemic: A longitudinal population-based survey study. *New Media & Society 26*(6), 3146–3167.

John, P. and T. Blume (2017). Nudges That Promote Channel Shift: A Randomized Evaluation

of Messages to Encourage Citizens to Renew Benefits Online: Nudges That Promote Channel Shift. *Policy & Internet 9*(2), 168–183.

König, R. and A. Seifert (2020). From Online to Offline and Vice Versa: Change in Internet Use in Later Life Across Europe. *Frontiers in Sociology 5*, 4.

Layne, K. and J. Lee (2001). Developing fully functional E-government: A four stage model. *Government Information Quarterly 18*(2), 122–136.

Madsen, C. and P. Kræmmergaard (2016). How to Succeed with Multichannel Management: A Case Study of Cross-Organizational Collaboration Surrounding a Mandatory Self-Service Application for Danish Single Parents. *International Journal of Public Administration in the Digital Age 3*(4), 94–110.

Madsen, C. and P. Kræmmergaard (2018). How to Migrate Citizens Online and Reduce Traffic on Traditional Channels Through Multichannel Management. *Innovative Perspectives on Public Administration in the Digital Age*, 121. Publisher: IGI Global.

Marc, C., M. Portela, C. Hannafi, R. Le Gall, A. Rode, and Stéphanie Laguérodie (2022). Non-take-up of minimum social benefits: quantification in Europe. Technical Report 94, Direction de la recherche, des études, de l'évaluation et des statistiques (DREES), Ministère de l'Emploi et de la Solidarité.

Norris, D. F. and M. J. Moon (2005). Advancing E-Government at the Grassroots: Tortoise or Hare? *Public Administration Review 65*(1), 64–75.

Pew Reseach Center (2017). Tech Adoption Climbs Among Older Adults. Technical report, Pew Research Center.

Pieterson, W. and J. van Dijk (2007). Channel Choice Determinants; An exploration of the factors that determine the choice of a service channel in citizen initiated contacts. *The Proceedings of the 8th Annual International Digital Government Research Conference* (228), 173–182.

Pirhonen, J., L. Lolich, K. Tuominen, O. Jolanki, and V. Timonen (2020). "These devices have not been made for older people's needs" – Older adults' perceptions of digital technologies in Finland and Ireland. *Technology in Society 62*, 101287.

Teerling, M. L. and W. Pieterson (2010). Multichannel marketing: An experiment on guiding citizens to the electronic channels. *Government Information Quarterly 27*(1), 98–107.

Teerling, M. L. and W. Pieterson (2011). How to improve e-government use: An empirical examination of multichannel marketing instruments. *Information Polity 16*(2), 171–187.

Tokovska, M., V. N. Ferreira, A. Vallušova, and A. Seberíni (2023). E-Government—The Inclusive Way for the Future of Digital Citizenship. *Societies 13*(6), 141.