

ICTs as an Antidote to Hardship and Inequality implications for New Zealand

Abstract

Contemporary ICTs such as mobile phones and the internet, are increasingly viewed as potential solutions to some of humanity's most complex and pressing problems, including poverty and inequality. But in New Zealand the evidence shows there are large gaps in the ICT-related resources and support available to New Zealand's digitally poor. Among the shortcomings are a profound lack of integration of ICT needs into social policy design and implementation, the absence of a programme of ongoing policy review and update, and insufficient research.

Keywords digital divide, digital inclusion, ICTs, social policy, poverty, inequality

Modern information and communication technologies (ICTs) are credited with improving the lives of people everywhere.² They are also increasingly a part of everyday life

for a growing proportion of the world's population. Among the consequences of this pervasiveness is heightened debate about so-called digital divides: New Zealand's 'digital first' national census in March 2018 was a

case in point (see Statistics New Zealand, 2018; Wilson, 2018). Yet discussion about ICTs as a form of government assistance to improve the lives of the digitally disadvantaged in developed countries is largely absent. This article focuses on the government's role in creating and providing new kinds of ICT-related safety nets and services for New Zealand's poor. It begins by introducing a model from the development literature that enables analysis of the rationale and achievements of ICT investment aimed at public goals (Heeks, 2010, 2014). The model's domains are applied to arrangements in New Zealand today, guided by the objective of using ICTs to achieve greater social and economic equality and less hardship. The ensuing discussion examines who is doing what to support the digitally excluded, with a focus on the role of the government. Public policy consequences and options for New Zealand conclude the article. Because some data were initially collated in early 2016, brief comment is also able to be made on relevant changes since then. First, however, is the need to define key terms and describe the nature and magnitude of digital divides in New Zealand today.

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Key terms

The rapid pace at which digital technologies, such as laptops, the internet, apps and mobile phones, are evolving and converging means there are advantages to referring to them collectively. Here the ICTs under discussion are the broad assortment of ‘tools to collect, store, analyse, and share information digitally’ (World Bank, 2016, p.2). Poverty is taken to mean a lack of money or other resources ‘to participate fully in life’s opportunities’ (Boston and Chapple, 2014, p.21). Inequality is used in the dictionary sense to mean unevenness or lack of equality. Among the many kinds of inequalities (see Boston, 2013, for an overview), this article has a focus on social and material ICT inequalities.

Digital divides

A definition of New Zealand’s digital divides is more elusive. Many explanations resort to lists of ‘digitally excluded’ population cohorts, circumscribed by their physical location, socio-economic circumstances, age, ethnicity, lack of uptake or use of specific ICTs or digital ICTs in general, and so on. Others rely on descriptions of ‘digitally engaged’ or ‘included’ cohorts or individuals, the corollary being that whoever does not fall within these categories constitutes the information or digitally poor.

In practice, however, any purported digital divide is a complex, multi-layered and evolving phenomenon (see Sylvester, Toland and Parore, 2017, for a recent and comprehensive review of the literature and analysis of the issues in marginalised communities in New Zealand). Further, not all aspects of the divide are cause for current societal concern. Nearly three quarters of New Zealand children aged 11 years and over own a mobile phone, for example, but for the bulk of children who do not, the reason is other than cost (Perry, 2017, p.97).

But concern about divides is justified when the absence of access to, and ability to use, ICTs hinders everyday activities that create social and economic value for the clear majority of New Zealanders, such as finding information and communicating with others. Smith et al. (2016) find that these divisions, as far as use of the internet goes, occur in New Zealand along household income, geographic and ethnic

Box 1: Features of the ICT for development value chain

Domain	Features
Readiness	<ul style="list-style-type: none"> Precursors are the systemic prerequisites to any initiative. They are predominately national-level and can be technological (eg, electricity, telecommunications infrastructure), data systems, human capabilities (eg, skills), institutional (eg, organisations or policies), vision, or drivers (eg, demand) Strategies turn precursors into inputs Inputs feed into individual initiatives, and can be technology, data, labour and knowledge, motivations, goals and objectives, money, incentives, leadership and political support
Availability	<ul style="list-style-type: none"> Implementation can occur via projects, programmes or policies Intermediates and deliverables are tangible products arising from implementation of an initiative, and can be locations (eg, public libraries), ICTs (eg, computers, phones) or software applications
<p>Enablers (accelerators) and constraints (brakes) occur outside, and act on, the availability and uptake domains. They usually signify the presence or absence of necessary precursors and inputs from the readiness domain³</p>	
Uptake	<ul style="list-style-type: none"> Adoption is the rate at which a target audience takes on a deliverable, eg, by purchasing an initiative or going to or connecting to it. Adoption may depend on the audience finding the deliverable acceptable (Figuères & Eugelink, 2014, p. 216) or a degree of enforcement (Heeks & Molla, 2009) Use relates to a deliverable’s actual usage by a target population (Heeks, 2010) Sustainability is to do with mechanisms that ensure a deliverable continues to be used over time. It may depend on the continued supply and reliability of precursors and inputs (Figuères & Eugelink, 2014, p. 202) Scalability to large numbers of people is required for the adoption and use of a deliverable to be sustained
Impact	<ul style="list-style-type: none"> Outputs are behavioural changes associated with use, eg, new communication patterns, new information and decisions, or new actions or transactions Outcomes are wider costs and benefits associated with ICTs, and can be financial and other quantitative or qualitative benefits, or disbenefits Development impacts are the contribution of ICTs to public goals and other impacts, whether intended or unintended, and may be positive or negative

Source: based on Heeks, 2018, pp.38–9, with other sources as indicated

lines, and compound when these factors overlap. Those who are older, live more rurally, have a lower household income, and who are not New Zealand European or Asian use the internet less widely and less frequently.

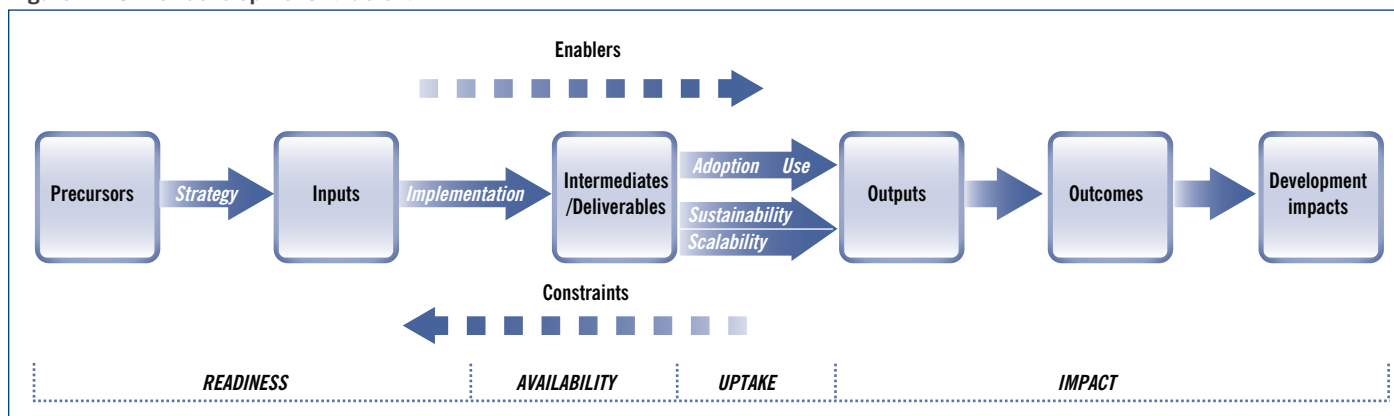
Briefly, to give a sense of the numbers involved, 9% of New Zealanders surveyed in 2015 aged 16 years and over do not use the internet (Crothers et al., 2016). Using Statistics New Zealand population estimates with data from the first quarter of 2016, this equates to approximately 319,250 people. An additional 11% very rarely use the internet (ibid.). Separately,

Perry (2017, p.95) reports that 12% of children do not have good access at home to a computer and the internet for homework; for children living in New Zealand’s materially poorest households, the figure is 57%.

ICTs for development

New Zealand’s new Labour–New Zealand First government announced the goal of closing the country’s digital divides by 2020 in November 2017 (Curran, 2017a). And, as the minister for government digital services, Clare Curran, stated a month later, international examples can be

Figure 1: ICT for development value chain



Adapted from Heeks, 2018, p. 38

instructive in achieving such an objective (Curran, 2017b). Usually ideas are sourced from richer countries (see, for example, recent analyses by Zwimpfer et al., 2017, and Innovation Partnership, 2017). But another overlooked resource are the lessons from decades-long experimentation by international aid agencies and donor and developing countries with emerging ICTs and the alleviation of poverty and inequalities (see Figuères and Eugelink, 2014; Heeks, 2018, ch.5; May, Waema and Bjåstad, 2014).

Heeks (2010) charts the evolution of huge annual expenditure on ICT-related development in poor countries over the previous 15 years. He finds that, broadly speaking, focus shifted from technical aspects of ICTs (including infrastructure) to their availability, to ICTs' uptake by targeted communities, and, most recently, to their developmental impact. Heeks has also developed an 'ICT for development' value chain. Figure 1 shows a simplified version of the chain; Box 1 defines its features (Heeks, 2018, p.38).

Applying the framework

Choice of framework

In what follows, Heeks' model is applied to New Zealand. But first a note on the choice of framework. Heeks designed it to show how ICTs can deliver development outcomes, illustrate the requirements for the creation of deliverables that enable development, and help identify which ICT elements and relations to focus on, given a desired outcome (Heeks, 2018, p.42). The chain is sufficiently generic that any public goal can be 'plugged' into it and provides the chance to analyse simultaneous initiatives. It also accommodates data from

multiple sources obtained using different methodologies (Heeks and Molla, 2009) and data at different levels, from national to households and individuals.

But there are weaknesses in the chain itself or its application here. These include a suggestion of linearity ascribed to what could be characterised as complex adaptive systems, even in the instance of apparently simple ICT initiatives (see, for example, Eppel and Lips, 2016). Further, measuring and evaluating poverty, inequality, outcomes and achievement of broad public goals is not straightforward. Also at issue can be variability in the quality, specificity and availability of secondary data, and problems with aggregating and comparing data from different sources (van Thiel, 2014, p.112). Finally, the novelty of the analysis, especially for developed countries, means there are few comparators.

Use of the framework

Use of Heeks' chain requires a goal or impact to be defined. To address the increasing problem of ICT-induced inequalities and exclusion, McKinsey and Company has suggested more ICTs for the poor (Manyika et al., 2016, p.100). The World Bank recommends upskilling employees into non-routine occupations in the 'race' against evolving digital technologies' disruption of labour markets (World Bank, 2016, pp.20–1). The solution here is taken to be McKinsey's one of more ICTs, and the desired outcome to be less hardship.

During the original research, the framework's definitions were employed as prompts for sourcing documents and websites for analysis. Relevant ICT investments, activities and programmes

were split across the chain's domains, according to whether the lead actor was central or local government, non-government organisations or individual citizens, or the private sector, including businesses' philanthropic activities.⁴ A two-year cut-off date was used, and the search confined to New Zealand initiatives aimed at reducing poverty or social or material inequality, with at least one ICT as a central enabler or driver of change, that were underway rather than concluded or planned. The analysis did not attempt to take in all initiatives aimed at all divides, nor all New Zealand research.

Only a fraction of the data can be presented here, although where possible it has been updated. Samples have been selected that enable discussion of central government's role, what more it could or should do, and on what grounds, and possible policy mechanisms to extend more ICTs to digitally disadvantaged New Zealanders living in hardship. But the development and examination of alternative scenarios, such as market-based solutions, and discussion about the relativity of digital poverty in New Zealand is largely precluded. Box 2 shows the data according to Heeks' four readiness, availability, uptake and impact domains.

Who is doing what?

The government's role

The government has a large and active role in Heeks' readiness domain. It establishes systemic precursors, devises strategy, and sources and allocates inputs to policies and programmes. Since the previous, National-led government's election in 2008, focus has been on faster and better network infrastructure, primarily for

Box 2: ICTs for social development in New Zealand

Readiness domain - precursors, strategies and inputs

- The Labour-led government's ICT goals include closing New Zealand's digital divide by 2020, strengthening social inclusion and cohesion, and protecting New Zealanders' digital rights (Curran 2018a)
- In August 2017, contracts were signed for the second phase of the Rural Broadband Initiative, which will extend improved broadband to over 70,000 rural households and businesses (Ministry for Business, Innovation & Employment [MBIE], 2017)
- From term 1 2018, schools and kura began teaching from curricula updated with new digital technologies content, with two years provided for full implementation of the changes (Ministry of Education, n.d.)
- In 2016/17, the Ministry of Education funded delivery of digital inclusion programmes by the 20/20 Trust (2017, p. 3) to 1,805 families with children in low-decile schools and refugee families
- Some libraries offer free internet access
- The 20/20 Trust (2017, p. 86) has a vision of "New Zealanders fully participating in the digital world"
- In 2015, SeniorNet (2016, p. 6) introduced 29,202 enrollees, 96% of whom were aged 60 years and over, to computers, portable touchscreen devices and emerging technologies
- Of people surveyed by Crothers et al. (2016) who did not use the internet, the main reason was 33% were not interested or did not think it was useful, 20% did not know how to use or were confused by technology, 18% did not own a device capable of accessing the web, 13% had no connection, 11% found it too expensive and 5% did not have the time

Availability domain - implementation, intermediates and deliverables

- The remit of Minister Curran's ministerial advisory group includes providing advice on a "blueprint for digital inclusion and digital enablement" (MBIE, n.d.)
- As at 31 December 2017, 304,574 rural households and businesses had the choice to connect to upgraded broadband internet (MBIE, 2018)
- Work and Income pays household ICT costs in some circumstances for some allowances, eg, Sole Parent Study Assistance guidelines designate internet or landline telephone expenses as allowable costs, provided a connection is necessary for course participation and not already in place⁵
- The Ministry for Social Development (MSD) made its MyMSD app available in September (2017a, p. 34) See <http://www.scoop.co.nz/stories/PO1604/S00369/mymisd-puts-clients-in-the-driving-seat.htm>. The costs to clients of data to use some of the app's services⁶ are negligible due to a deal with telecommunications companies
- The overall ratio of students per school-provided digital device for learning remains the same as 2011 levels (Johnson, Macguire & Wood, 2017, p. 28)
- Decile 1 to 3 schools are significantly more likely to report

- participating in the upgrade of network infrastructure and NGO-led digital inclusion programmes (Johnson et al., 2017, p. 106)
- The 20/20 Trust (2017, pp. 4, 5) has several programmes, eg, Family Connect, a pilot digital literacy programme for adults with few or no qualifications funded by the Tertiary Education Commission
- The Spark Foundation's Jump programme supplies free pre-pay wifi modems to families with school-aged children, each preloaded with 30GB and which cost from \$10 per month to top up⁷

Uptake domain - adoption, use, sustainability and scalability

- As at 31 December 2017, 112,805 rural households and businesses had adopted upgraded broadband internet (ie, 40.3% of the 304,574 who had the option to connect) (MBIE, 2018)
- In 2016/17, 375,000 registrations for MyMSD had been made (MSD, 2017a, p. 5)
- Over 98% of students apply online for financial support and assistance (MSD, 2017b, p. 23)
- 80% of families graduating from the Computers in Homes digital inclusion programme took up the offer of a subsidised internet connection in their home (20/20 Trust, 2017, p. 27)
- One third of principals report their school accesses philanthropic support for learning with digital technologies, one third's schools are considering it, and one third's schools do not and are not considering it (Johnson et al., 2017, p. 26)
- The 2020 do not and are not Trust's (n.d.) digital inclusion map plots the availability of community wireless networks, computer access and training, digital champions, and digital initiatives across the country; InternetNZ's (n.d.) Trust's digital divide map adds correlations between social well-being and digital inclusion

Impact domain - outputs, outcomes and development impacts

- In 2016/17, 66% of applications for financial assistance from MSD (2017a, p. 2) were completed online, up 10% from the previous year
- MSD (2017a, p. 17) saw the greatest online uptake increase in 2016/17 in the Sole Parent Support category, followed by supplementary benefits and Jobseeker Support
- 60% of MSD's (2017a, p. 34) clients who work part-time use MyMSD to advise their weekly income
- Nearly one third of participants in Computers in Homes reported 12 months after course completion that it had helped them find paid work (20/20 Trust, 2017, p. 19)
- Half of surveyed principals rate the impact of digital technologies on student learning outcomes as moderate; another third rate it as significant (Johnson et al., 2017, p. 75)
- Decile 1 to 3 schools are significantly less likely to publish website information, use email between teachers and parents, email newsletters and use parent portals (Johnson et al., 2017, p. 101)

economic reasons. These programmes are set to continue under the Labour-led coalition, but with an additional focus on digital inclusion and rights. Schools are the main vehicle through which the state is modernising the nation's ICT skills.

Central government inputs are near-universal (for example, appropriations to build infrastructure) or highly targeted (for example, the few instances of payment of household ICT costs). Local government inputs tend towards the universal (for

instance, public library resources), while non-government organisations' and businesses' philanthropic inputs are targeted, by focusing on children and their families or older New Zealanders, for example.

Table 1: Policy options

POLICY MECHANISM	TARGET POPULATION TARGET ICT(s)	STRENGTHS	WEAKNESSES
1. Community Services Card subsidy-type arrangements (ie, vouchers), sufficient to offset some costs but not unlimited	<ul style="list-style-type: none"> • Low income households • Hardware, such as laptops, computers or smartphones • ICT-related services, such as setup and maintenance costs 	<ul style="list-style-type: none"> • Sufficiently flexible to apply to sole parents, the elderly, urban and rural dwellers, low-income wage earners, and a range of ICTs • Well established in other sectors (eg, health) • Less expensive than universal assistance (Boston & Chapple, 2014, p. 100) 	<ul style="list-style-type: none"> • Blunt cut-off point • Higher administration and compliance costs, relative to overall assistance provided (Boston & Chapple, 2014, p. 101)
2. Subsidies for access to ICTs, allocated from telecommunications development levies	<ul style="list-style-type: none"> • Low income households, via discounts on monthly bills and/or higher data caps from designated providers • Household broadband internet access and/or mobile voice, text or data services 	<ul style="list-style-type: none"> • International examples to learn from (eg, United States, South Korea) • No overall increase in social assistance costs • Levies and telecommunications service obligations are already in place in New Zealand 	<ul style="list-style-type: none"> • The levies are already being used for fast internet infrastructure, a new emergency caller location system, and services for the deaf (MBIE, 2017)
3. Higher families tax credits	<ul style="list-style-type: none"> • Low income families • Any ICT • Also housing, electricity and data access 	<ul style="list-style-type: none"> • Sound evidence of a link between income and ICT adoption and uptake (Crothers et al., 2016; Statistics New Zealand, 2015) • Families can determine their own needs • Highly targeted 	<ul style="list-style-type: none"> • No guarantee funds will be spent on ICTs (Boston & Chapple, 2014, p. 100) • Less effective in the event of information asymmetry or uncertainty (Boston & Chapple, 2014, p. 99)
4. Substantial subsidies to targeted schools, based on decile ratings or other defined need	<ul style="list-style-type: none"> • School children and schools • Computers, software and broadband • Also data access and electricity 	<ul style="list-style-type: none"> • Highly targeted and highly meritorious • Helps ameliorate schools' concerns about hardware, software and online services costs (Johnson, et al., 2017, p. 83) 	<ul style="list-style-type: none"> • If devices cannot be transported home, or there is no internet at home, wider educative benefits may be foregone • Staff ICT professional development is also needed (Johnson et al., 2017, p. 83)
5. Higher student loan thresholds for course-related costs and living costs	<ul style="list-style-type: none"> • Tertiary education students • Any ICT • Also data access 	<ul style="list-style-type: none"> • Students can determine their own ICT needs • Well established in the education, social services and tax systems 	<ul style="list-style-type: none"> • Higher indebtedness at graduation has risks and consequences (Shaw & Eichbaum, 2011, p. 261) that the disadvantaged may be least capable of bearing

Having made ICT deliverables available, central government activity largely concludes, and in the uptake and impact domains the market takes over (see Commerce Commission, 2017; InternetNZ, 2017). But the work of public libraries, schools and non-government organisations continues to support New Zealanders' adoption and use of ICTs. The government re-emerges in the impact domain in the form of many organisations that, like the Ministry of Social Development, want to transact digitally with New Zealanders. Also active in the impact domain are a handful of government agencies, non-government organisations, and researchers collecting and examining evidence of the

use and influence of ICTs on social and educational policy outputs and outcomes.

Many gaps, few overlaps

Looking across Heeks' domains in Box 2, and still concentrating on the government, the biggest gap is between the delivery of intermediates (such as internet fibre) and ensuring that there is effective non-market support for their equitable and wide adoption and use in the uptake domain. A second large gap in the data relates to government agencies' activities in and between the uptake and impact domains.

The ultrafast broadband programme illustrates both points. Curran's expectation in February 2018 was that by 2022, 87% of

New Zealanders would have the option of connecting to higher-speed internet (Curran, 2018b). By the end of 2017, 40% of those with access had chosen to connect (Ministry of Business, Innovation and Employment, 2018). But current policy settings preclude the Ministry of Social Development's one million-plus clients receiving direct support, above their present eligibility, to act on this choice. Online interactions are wanted by its clients, and arrangements have been made so that the cost of data for some interactions is negligible. The benefits for its clients who transact in this way are said by the ministry to include savings of time and money, as well as it being more convenient (Ministry of Social Development, 2017b, p.27). First,

however, the precursors suggested by Heeks' framework, such as possession of a smartphone, tablet or desktop computer, must be satisfied. As discussed shortly, for many New Zealanders this is non-trivial. Then support must be extended to others, so they can experience the same benefits and new divides are not created.

Public policy implications

Heeks' framework is designed to provide guidance on decisions and actions in the pursuit of ICT-enabled goals, including those with social, economic or educational aims (Heeks, 2018, p.38). Three major observations about past and current government ICT policy decisions and disadvantaged New Zealanders arise. First, by concentrating most of a decade's public ICT investment on infrastructure, the previous government in effect took New Zealand 'back' to the beginning of the value chain. This, of course, has happened in many other countries, and perhaps must occur periodically when new technologies – railway, electricity – fundamentally change the order of things. The commensurate evolution of social policy, however, has been neglected by successive governments to the extent that it is profoundly unfit for the digital age. ICT-related allowances and benefits that predominantly focus on access to landline telephones,⁸ for example, require radical overhaul and ongoing review.

Second, education features as a continuous thread throughout the chain. Actors are at work in all four domains, from readiness to impact. There are, however, still major gaps. The issue of school children's universal access to devices and the internet at school and at home has not been resolved, for example. Until it is, ICT-induced inequities and inequalities in New Zealand's education system are expected to persist and compound (Starkey, Sylvester and Johnstone, 2017). More striking still is the apparent absence of the direct provision of public services at scale that support digitally-disadvantaged New Zealanders, in the same way that youth, families, working-age people, students, those with disabilities and seniors are helped into secure housing and employment (Ministry of Social Development, 2017a, p.6). For these population cohorts, and to these core

functions, it is arguably time New Zealand added at least some basic ICTs and the support to ensure their effective use.

Third, the available evidence is silent about many major questions to do with life in New Zealand today. What of disadvantaged young people and adults searching for work or enrolled in tertiary education, for example? Is it any longer possible, practically speaking, to undertake tertiary study without access to a computer or the internet at home? Can work be found without access to a mobile phone or the internet? And what are the additional costs incurred by the absence of these technologies and, in an era of social investment, who bears them?⁹ For these, and numerous other, questions there are insufficient answers.

Minimum ICT thresholds

New Zealand's contemporaries are responding to digital divide issues in a variety of ways. In some instances, countries are adding new ICTs to their regulatory universal service obligations. Until recently, for many governments, including those of New Zealand, Australia, the United Kingdom and Japan, that generally meant providing citizens with reasonable access to a connection for a landline telephone, payphones and the like (Calvo, 2012). Achieving agreement on changes to universal services is not easy. The European Commission's current reforms, for example, focus on updating affordability safety nets. But even as these changes, a decade in the making, were being finalised before the European Parliament's involvement, they were judged outdated and lacking relevance in the context of an evolving internet (Renda, 2017).

Other challenges range from the ideological to the technical, and include at-times irreconcilable views on the relationships between ICTs and human progress, an unstable policy environment as new ICTs and research findings emerge, and large gaps in current data. The United Kingdom, however, declared in December 2017 an intention to make citizens' ability to choose to connect to fast broadband a legal right by 2020 (Department for Digital, Culture, Media and Sport, 2017). But viewed using Heeks' framework as applied here, this merely shores up broadband

availability, and does nothing new to safeguard its equitable uptake.

ICTs, target groups and options for New Zealand

One immediate place New Zealand could start is with existing institutions and policy mechanisms. Table 1 presents five options for meeting the basic ICT needs of school-aged children from low-income families, disadvantaged adults enrolled in tertiary education, and low-income adults more generally. Each row contains a policy mechanism, a target population and suitable ICTs (and sometimes enablers, such as data access), and its strengths and weaknesses. The table does not estimate the potential costs or cost-effectiveness for each option, but these can be calculated, preferably using the most up-to-date ICT data possible.

The options, which are not mutually exclusive, are intended to illustrate how some ideas in this article might be put into action. None alone nor all of them would eliminate the incidence of digital poverty in New Zealand, even if that was a realistic, workable or desirable goal. The domestic and international evidence shows, for instance, that the targeting of families, children and individuals living in hardship, and encouraging their take-up of newly available ICTs, can be challenging. Reasons include the lived realities of some poor, such as a high degree of transience (20/20 Trust, 2017, p.12), competition at home towards children or young people's access to devices (Hartnett, 2016; Lips et al., 2017, p.33), lack of awareness about ICTs' benefits or the motivation to adopt them (Sylvester, Toland and Parore, 2017), vulnerabilities of some kinds of policies to abuse by recipients and fraud (Davies, 2016), and ongoing concerns about the real and perceived costs of accessing and using ICTs. Also no doubt at play would be the influence of broader societal views, such as ideas that anyone who wants an ICT should pay for it, or that the poor are differently and especially ill-equipped to deal with the downsides of ICT's (see Britz, 2004, for a survey). Objections from anti-poverty campaigners that money and other resources are being diverted from food and housing to ICTs could be rivalled by welfare opponents' concerns about increases to

social assistance. But some or all of these may prove spurious arguments for withholding from the poor ICTs that benefit many other people, and few are insurmountable. The evidence shows increasing demand for more ICTs from New Zealanders who receive social services, and, when all elements of Heeks' framework are tended to, their sustained and successful take-up of ICTs is possible.

Conclusion

New Zealand needs a full and complete ICT policy framework that reflects social, economic and educational goals for all New Zealanders. An explicit aim of the framework must be the creation of modern, complementary and cost-effective ICT social policies. Among the first target populations for these initiatives should be children and young people from poor

families and low-income adults, including students. The entirety of the framework must be revisited often, more frequently than many others are, and not solely for economic development motives. Further, new core social development functions and public services should be considered that enable digitally-excluded New Zealanders' sustained adoption and use of modern ICTs at scale. To support these changes, investment in ongoing research to expose, explain and address gaps in current knowledge is also required.

- 1 This article is based on research undertaken by the author as part of a Master of e-Government at the School of Government at Victoria University of Wellington. The research was awarded the 2017 Holmes Prize in Public Policy.
- 2 This article is necessarily based on assumptions that remain unexplored here about the relationships between society, ICTs and the role of democratically-elected governments in welfare states. In fact, many aspects of these relationships are unfolding rapidly and highly contested. See Gluckman, 2018, for recent commentary on some of the issues.
- 3 For example, some would have it that the issues are wider,

more systemic and solved not by focusing on technologies but on adequate minimum levels of income, equality of and achieving equity in education, and so on. See Dutton and Graham, 2014, pp.5–8 for a survey of different possible perspectives. Where this is especially relevant to New Zealand is the effects that higher minimum wages, fee-free tertiary education, and other enablers planned by the Labour-led coalition will have on otherwise unassisted ICT take-up by the poor.

- 4 In practice, of course, this split quickly breaks down.
- 5 At <https://www.workandincome.govt.nz/map/employment-and-training/specific-employment-related-assistance/sole-parent-study-assistance/internet-01.html> on 18 March 2018.
- 6 For exclusions, see <https://www.workandincome.govt.nz/about-work-and-income/our-services/cheap-as-data/what-services-can-be-used-with-cheap-as-data.html>.
- 7 See <https://www.sparknz.co.nz/what-matters/spark-jump/>.
- 8 See, for example, the guide to telephone costs for the disability allowance at <https://www.workandincome.govt.nz/map/income-support/extra-help/disability-allowance/telephone-01.html> on 18 March 2018.
- 9 By one account, being online can benefit individuals by nearly \$1,000 annually (see Zwimpfer et al., 2017, p.2).

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