

Article

No One Left Behind? Comparing Poverty and Deprivation between People with and without Disabilities in the Maldives

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Abstract: The 2030 Sustainable Development Goals call for the disaggregation of all indicators by disability and other characteristics so as to “leave no one behind” from development progress. Data on disability, however, is acknowledged to be lacking, which is essential for informing policy and planning. Consequently, this study estimates the prevalence of disability in the Maldives and compares indicators of poverty and living conditions between people with and without disabilities, using nationally-representative, population-based data (n = 5363). The prevalence of disability was estimated at 6.8%. Overall, this research finds that people with disabilities are at risk of being left behind from progress across multiple Sustainable Development Goal domains, including in combatting income poverty, food insecurity and exclusion from health, education, work and social participation, and vulnerability to violence. Further, amongst people with disabilities, people with cognitive and mental health impairments, people living outside the capital, Male’, and children and working-age adults tend to face the highest levels of deprivation.

Keywords: disability; Sustainable Development Goals; Maldives

1. Introduction

It is estimated that 15% of the global population—1 billion people—are living with a disability, with the majority residing in low and middle-income countries [1]. As a group, people with disabilities face an increased risk of poverty and social exclusion, due to barriers to participating in paid work and education, negative attitudes towards disability, inaccessible environments and information, extra disability-related costs (e.g., assistive devices, personal assistance), and lack of affordable, quality disability-related services and support [1–4]. The United Nations Convention on the Rights of People with Disabilities (UNCRPD), which has been ratified by 177 countries, codifies the rights of people with disabilities to full inclusion on an equal basis as others [5,6]. However, people with disabilities still face large inequalities in realising their rights, which is evident by disparities compared to people without disabilities in social participation and access to education, healthcare, and employment [7–9].

The 2030 Agenda for Sustainable Development, which was adopted by all United Nations member states in 2015, outlines a global strategy for ending poverty “in all its forms”, inequality and other deprivations, particularly through its 17 Sustainable Development Goals (SDGs) [10]. The SDGs represent an advance from Millennium Development Goals (MDGs), which faced criticism over their failure to include considerations of disability, thus potentially widening inequalities and impeding fulfilment of some of its Goals [11,12]. Consequently, the SDGs call for the disaggregation of all indicators across its 17 Goals by disability and other characteristics so as to “leave no one behind” from

development progress [10]. State Parties to the UNCRPD are also obligated to regularly collect and disseminate data on disability under Article 31 [5].

Data on disability is essential to track progress towards the SDGs and other development goals, fulfil States' commitments to the UNCRPD and to inform policy and planning [12,13]. Data disaggregation by disability can identify sources of exclusion and the extent of disparities in comparison to people without disabilities, which is needed for determining priorities for action [13]. Data on the prevalence of disability is also required for the design and budgeting of services. In addition to data disaggregation, information on disability-specific indicators—such as access to rehabilitation and assistive devices, provision of accommodations—are also important to capture to provide the full picture of the needs of people with disabilities. Further, more evidence is needed to explore differences amongst people with disabilities, as risk of poverty and social exclusion may differ by other characteristics, such as impairment type, gender and age.

This study estimates the prevalence of disability in the Maldives and compares indicators of poverty and deprivation between people with and without disabilities, using nationally-representative, population-based data. The Maldives is an island nation with a population of approximately 400,000 people. A third of the population is based in the capital, Male', while the remaining reside across 188 islands, creating challenges for the distribution of services [14]. Still, the Maldives is an upper-middle income country, which has put in place policies and programmes to promote the inclusion of people with disabilities across society. For example, the Maldives has ratified the UNCRPD and has codified the rights of people with disabilities to full inclusion in national laws such as the Disability Act (2010). The Maldives also has disability-specific programmes, such as a disability-targeted, unconditional cash transfer (130 USD/month) and schemes for the provision of assistive devices and technology. Findings from this research may, therefore, indicate whether these initiatives have been sufficient to promote the full inclusion of people with disabilities, and what gaps remain.

2. Methods

Data were collected from July to August 2017 through a nationally-representative population-based survey with a nested case-control study. All questionnaires were translated into Dhivehi, pilot-tested and administered using computer tablets (via Open Data Kit). Data collectors underwent a week-long training to learn study protocols and practice using data collection tools.

2.1. Population-Based Survey

A population-based survey was conducted to estimate the prevalence of disability in the general population, identify participants for the nested case-control and compare household-level indicators between households with and without members with disabilities.

Data from the 2014 National Census were used as the sampling frame [14]. The sample size target was set at 6500 people age 2+ based on an expected prevalence of disability of 7% and response rate of 75%, confidence level of 95%, design effect of 1.5 and precision of 15%. A two-stage sampling strategy was employed based on the methodology used in other surveys [15–17]. In the first stage, 52 clusters (island enumeration areas) were identified through probability proportionate to size sampling. In the second stage, modified compact segment sampling was used to identify households from which 125 Maldivian citizens aged 2+ (including non-responders) could be enumerated. If the segment did not include 125 people, then another segment was chosen at random and enumeration continued until 125 are reached.

All enumerated Maldivian citizens aged 2+ were screened for disability. All adults (aged 18+) were asked the Washington Group Extended Set (WG-ES) questions on disability, while children aged 2–4 and 5–17 were asked their respective age-specific modules of the UNICEF–Washington Group Child Functioning [18,19]. These question sets include 9 to 11 questions, depending on the age of the respondent. Participants self-reported, although proxies were used for children 10 years and younger,

people with impairments that severely affected their ability to understand/communicate and household members that were not reachable after at least three revisits.

The Washington Group questions focus on difficulties with activities (e.g., seeing, hearing, walking or climbing stairs, remembering or concentrating, self-care and communicating). For most questions, the respondent can choose one of four options: no difficulty, some difficulty, a lot of difficulty or cannot do at all. For the purpose of this study, people who answered “cannot do at all” or “a lot of difficulty” for at least one question were considered to have a disability. For adults (18+), anxiety and depression were measured through two questions on the frequency and intensity of symptoms. Disability was defined as experiencing symptoms daily, which that were of an intensity described as “a lot”. Children aged 5+ also received questions on anxiety and depression, although only frequency was used to measure disability.

2.2. Nested Case–Control Study

People identified as having a disability in the population-based survey were invited to take part in a case–control study as cases (for anxiety/depression, respondents also had to report positively to at least one question on the impact of symptoms on either schooling, work or social relations, to better match national definitions of disability). Cases also included people who were registered at the National Social Protection (by the Maldivian government) as having a disability (e.g., Disability Allowance recipients). For each case identified, one control without disabilities was selected as a comparison. Controls were drawn from the population-based survey and were the same sex, similar age (± 5 years) and living in the same cluster (or if a suitable control was not identified, from within the same administrative island or atoll) as the case. Controls could not be from a household that included a member with a disability. One control was selected at random if multiple eligible controls were available for a case.

Questionnaires given to case–control participants collected data on household poverty and individual indicators of well-being (e.g., social participation, education, employment).

2.3. Data Analysis

The prevalence of disability was measured using the aforementioned definition of disability. Although the survey design is self-weighting, sample weights were used as certain groups (e.g., working-age men) were underrepresented according to the 2014 Census (see Table S1 for sampling weights).

Multivariate regression was used to compare the indicators below (Table 1) between people with and without disabilities, which were selected as they are in line with SDG domains, and, in many cases, are SDG recommended indicators. Regression analyses included adjustments for the individual’s age and gender and the household’s location (greater Male’ vs. atolls outside Male’). Distribution of indicators of deprivation was also disaggregated by age group (<18, 18–64, 65+ years), gender, location (Male’ vs. other atolls) and impairment type. Impairment types were grouped as physical (functional limitation in mobility, upper body), cognitive (functional limitation in communicating, cognition), sensory (functional limitation in seeing, hearing) and mental health (anxiety, depression and other write-in mental health conditions not captured in the Washington Group question sets).

Table 1. Indicators of poverty and deprivation.

Domain	Definition
<i>Poverty and household living conditions</i>	Household per capita income is below the international poverty line for upper–middle income countries (\$5.50 per person per day, 2011 purchasing power parity) (SDG Indicator 1.1.1)
	Household faces moderate or severe food insecurity (SDG Indicator 2.1.2)
	Household does not have an improved sanitation facility and drinking water source (SDG Indicators 6.1.1 and 6.2.1)

Table 1. Cont.

Domain	Definition
Health	Household spent more than 25% of income on medical expenses in the last month (SDG indicator 3.8.2)
	Individual experienced a serious health problem in the last 12 months
Education	Individual (age 6–17) is enrolled in school
	Individual (age 13+) has not completed primary school
	Individual (age 13+) is illiterate (SDG Indicator 4.6.1)
Work	Individual (age 15–65) is not working or in school (SDG Indicator 8.5.2)
Social participation	Individual experienced violence or discrimination in the last 12 months (SDG Indicators 10.3.1, 16.1.3)
	Individual not consulted in household decision-making (age 15+)
	Individual did not vote in last election (age 21+)

2.4. Ethical Considerations

Ethical approval was granted from the London School of Hygiene & Tropical Medicine, the Maldives National Bureau of Statistics and the National Health Research Committee at the Maldives Ministry of Health.

Informed consent was obtained from all study participants before beginning any interviews (written or recorded). For children below 18 years (age of consent) and people with impairments that severely limited their ability to understand/communicate, a carer provided consent and answered on their behalf as a proxy. In these instances, the child/person with a disability provided assent and their input was still sought whenever possible and appropriate. Individuals who reported unmet health needs were provided with information sheets with contact details on available local services.

3. Results

A total of 5363 people across 1065 households were screened for disability (response rate of 82%). Using Washington Group criteria, 395 people were identified as having a disability, giving a prevalence of disability of 6.8% (95% CI: 6.1–7.5%) (Table 2). Disability prevalence increased significantly with age, from 3.3% in children to 42.7% in adults over 75 years, and was slightly more common in women. Mobility limitations (2.7%), followed by anxiety and depression (1.9%) were the most commonly reported functional limitations.

Table 2. Prevalence of disability by key characteristics (n = 5361).

		n	Prevalence (95% CI)	aOR (95% CI) ^Ω
Overall Prevalence of Disability		396	6.8% (6.1–7.5%)	-
Sex	Male	163	6.2% (5.3–7.2%)	Reference
	Female	233	7.4% (6.5–8.4%)	1.3 (1.0–1.6)
Age Group	2–17 years	62	3.3% (2.6–4.3%)	Reference
	18–39 years	91	4.3% (3.5–5.2%)	1.2 (0.9–1.7)
	40–59 years	116	10.2% (8.5–12.1%)	3.2 (2.3–4.5)
	60–74 years	70	24.2% (19.5–29.1%)	9.4 (6.4–13.7)
	75+ years	57	42.7% (34.1–52.0%)	24.0 (15.2–37.8)

Table 2. Cont.

		n	Prevalence (95% CI)	aOR (95% CI) ^Ω
Location	Malé	148	7.2% (6.2–8.5%)	Reference
	Central	52	5.1% (3.9–6.7%)	0.6 (0.4–0.9)
	South	114	8.0% (6.6–9.5%)	1.0 (0.7–1.3)
	North	81	5.8% (4.7–7.2%)	0.6 (0.4–0.8)
Functional domain	Seeing	82	1.5% (1.2–1.8%)	-
	Hearing	37	0.6% (0.4–0.8%)	-
	Mobility	164	2.7% (2.3–3.2%)	-
	Anxiety/depression [¥]	115	1.9% (1.6–2.3%)	-
	Self-care [¥]	68	1.1% (0.9–1.4%)	-
	Communicating	58	1.1% (0.9–1.5%)	-
	Cognition	92	1.6% (1.3–1.9%)	-
	Upper body ^α	72	1.5% (1.3–1.9%)	-

^Ω Adjusted by gender, age, location. [¥] Measured in people aged 5+ only. ^α Measured in people 18+ only.

Table 3 measures differences across indicators of poverty and deprivation between people with and without disabilities and their households. Table 4 then disaggregates indicators of poverty amongst people with disability, by age, gender and location (Male' vs. other atolls).

Table 3. Indicators of poverty and deprivation by disability status.

Indicators	People with Disabilities (%)	People without Disabilities (%)	aOR (95% CI) ^Ω
<i>Poverty and household living conditions</i>			
Below international poverty line	91 (24.6%)	61 (18.3%)	1.8 (1.2–2.7)
Food insecurity	176 (45.8%)	87 (25.8%)	2.4 (1.8–3.4)
Non-improved WASH	5 (1.3%)	10 (3.0%)	0.4 (0.1–1.3)
<i>Health</i>			
Experienced a health problem	71 (18.7%)	27 (8.2%)	2.5 (1.5–4.0)
Catastrophic health expenditures	35 (9.5%)	40 (12.0%)	0.8 (0.5–1.3)
<i>Education</i>			
Not enrolled in school (ages 6–17)	3 (6.7%)	0 (0%)	n/a
No primary school (age 13+)	226 (69.1%)	165 (56.3%)	2.4 (1.6–3.7)
Illiterate (age 13+)	44 (13.5%)	7 (2.4%)	6.5 (2.9–14.9)
<i>Work</i>			
Not working (ages 15–64)	136 (62.4%)	93 (43.4%)	2.3 (1.6–3.5)
<i>Social participation</i>			
Not consulted in family decisions (ages 15+)	78 (26.2%)	27 (9.6%)	3.4 (2.1–5.5)
Did not vote (ages 24+) ^β	53 (18.2%)	18 (6.7%)	2.7 (1.5–4.8)
Experienced violence (12 months)	107 (27.8%)	29 (8.8%)	4.4 (2.8–6.9)

^Ω Adjusted for age group, sex, location (Male' vs. other atolls); ^β Age is 21+ to capture people who were 21+ at last election (minimum voting age).

Table 4. Indicators of poverty and deprivation amongst people with disabilities, disaggregated by age, gender and location.

	<i>Gender</i>		<i>Location</i>		<i>Age Group</i>			<i>Impairment type</i> ^Ω			
	<i>Women</i>	<i>Men</i>	<i>Male'</i>	<i>Other Atolls</i>	<i>2–17</i>	<i>18–64</i>	<i>65+</i>	<i>Physical</i>	<i>Cognitive</i>	<i>Sensory</i>	<i>Mental Health</i>
	<i>n = 219</i>	<i>n = 165</i>	<i>n = 153</i>	<i>n = 231</i>	<i>n = 61</i>	<i>n = 217</i>	<i>n = 102</i>	<i>n = 190</i>	<i>n = 114</i>	<i>n = 115</i>	<i>n = 93</i>
<i>Household poverty</i>											
Income poor	91 (41.6%)	62 (37.6%)	26 (17.0%) ***	127 (55.0%)	27 (44.3%) ***	100 (46.1%) ***	23 (22.6%)	57 (30.8%) *	50 (45.5%)	48 (43.2%)	38 (43.2%)
Food insecurity	103 (46.8%)	73 (44.2%)	76 (49.4%)	100 (43.3%)	36 (59.0%) ***	106 (48.9%) **	32 (31.4%)	81 (42.6%)	64 (56.1%) *	56 (48.7%)	52 (57.8%) *
Non-improved WASH	3 (1.4%)	3 (1.8%)	2 (1.3%)	4 (1.7%)	1 (1.6%)	0 (0.0%)	5 (4.9%)	3 (1.6%)	2 (1.8%)	4 (3.5%)	1 (1.1%)
<i>Health</i>											
Health problem	25 (15.3%)	46 (21.2%)	32 (21.2%)	39 (17.0%)	9 (14.8%)	44 (20.5%)	18 (17.7%)	43 (22.8%)	24 (21.4%)	25 (21.9%)	25 (28.1%) *
Health expenditures	22 (10.0%)	17 (10.3%)	25 (10.8%)	14 (9.1%)	8 (13.1%)	22 (10.1%)	7 (6.9%)	17 (9.0%)	11 (9.7%)	5 (4.4%) *	11 (12.2%)
<i>Education</i> ^α											
No primary school (age 13+)	138 (68.0%)	92 (71.9%)	83 (62.4%)	147 (74.2%) *	n/a	137 (62.0%) ***	89 (87.3%)	147 (79.5%) **	60 (77.9%) *	83 (75.5%)	42 (57.5%)
Illiterate (age 13+)	18 (9.0%) ***	26 (20.5%)	12 (9.2%)	32 (16.2%)	n/a	25 (11.5%)	18 (17.7%)	25 (13.6%)	25 (33.3%) ***	17 (15.6%)	3 (4.2%) *
<i>Work</i>											
Not working (ages 15–64)	99 (66.4%)	40 (55.6%)	61 (64.9%)	78 (61.4%)	n/a	139 (62.9%)	n/a	68 (66.0%)	40 (80.0%) **	43 (61.4%)	35 (58.3%)
<i>Social participation</i>											
Decision-making (age 15+)	43 (23.5%)	35 (30.4%)	31 (25.6%)	47 (26.6%)	n/a	51 (24.4%)	26 (30.2%)	44 (26.4%)	23 (40.4%) **	22 (22.7%)	20 (29.4%)
Voting (age 24+) ^β	27 (15.1%)	26 (23.0%)	28 (23.9%) *	25 (14.3%)	n/a	28 (14.7%)	25 (24.5%)	36 (20.7%)	22 (34.9%) ***	21 (20.6%)	10 (16.4%)
Violence (age 15+)	51 (26.0%)	31 (24.8%)	51 (26.4%)	31 (24.2%)	n/a	67 (31.0%) **	15 (14.7%)	42 (22.8%)	22 (31.0%)	29 (26.9%)	33 (46.5%) ***

Statistical significance in multivariate regression: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ (comparator groups: men for gender, other atolls for location, age 65+ for age group; for impairment type the comparator for each category is people without that impairment); ^Ω groups not mutually exclusive. ^α Indicator on current enrolment excluded due to small sample size; ^β indicator restricted to age 24+ as this corresponds to 21+ at last election (minimum voting age).

3.1. Poverty and Household Living Conditions

People with disabilities had approximately twice the odds of living in income poor (aOR = 1.8, 95% CI: 1.2–2.7) and food insecure households (aOR = 2.4, 95% CI: 1.8–3.4) compared to people without disabilities. Amongst people with disabilities, income poverty was lower in Male' compared to other atolls (17% vs. 55%, $p < 0.001$). Both income poverty and food insecurity were least common amongst older adults (ages 65+), compared to both children and working-age adults. For example, 31.4% of households with older adults with disabilities faced food insecurity, compared to 48.9% of households with working-age adults with disabilities (aOR = 2.0, 95% CI: 1.2–3.4) and 59.0% of households with children with disabilities (aOR = 3.1, 95% CI: 1.6–6.0). Further, people with physical impairments were less likely to be in an income-poor household compared to people with other impairments (aOR = 0.6, 95% CI: 0.3–1.0), while people with cognitive and mental health impairments were more likely to be food insecure (cognitive: aOR = 1.6, 95% CI: 1.0–2.7; mental health: aOR = 1.7, 95% CI: 1.0–2.7). Although women with disabilities were slightly more likely to live in income-poor and food-insecure households, this difference was not statistically significant.

Almost all survey respondents lived in a household with improved water and sanitation sources. There was no difference in WASH access between people with and without disabilities or amongst people with disabilities.

3.2. Health

People with disabilities were more likely to experience a serious health problem in the last 12 months compared to people without disabilities (aOR = 2.5, 95% CI: 1.5–4.0). Amongst people with disabilities, people with mental health difficulties were more likely to have experienced a health problem compared to people with other impairment types (aOR = 2.0, 95% CI: 1.1–3.6). There was no difference in the likelihood of experiencing a health problem by gender, location or age amongst people with disabilities.

There was also no difference between people with and without disabilities in household catastrophic health spending. People with sensory impairments were less likely to have experienced catastrophic health expenditures compared to people with other impairments. There was no difference in the likelihood of experiencing catastrophic health expenditures by gender, location or age group.

3.3. Education

Almost all school-aged children with and without disabilities were attending school (100% enrolment for children without disabilities, 93.3% enrolment for children with disabilities). There were no statistically significant difference in school attendance by age, gender, location or impairment type amongst children with disabilities.

Concerning educational attainment, people with disabilities were more likely not to have completed primary school compared to people without disabilities (aOR = 2.4, 95% CI: 1.6–3.7). Primary school attainment differed significantly with age amongst people with disabilities, as 62.0% of adults aged 18–64 years had not completed primary school, compared to 87.3% of adults aged 65+ ($p < 0.001$). Amongst people with disabilities, primary school completion was also higher in Male' compared to other atolls (non-completion 62.4% in Male' compared to 74.2% in other atolls, $p = 0.04$). Primary school completion was lowest for people with physical and cognitive impairments (non-completion: 79.5% and 77.9%, respectively, $p < 0.05$ compared to other impairment types).

Illiteracy was also more common amongst people with disabilities compared to people without disabilities (aOR = 6.5, 95% CI: 2.9–14.9). Amongst people with disabilities, illiteracy was less common in women (aOR = 0.4, 95% CI: 0.2–0.8) and people with intellectual impairments (aOR = 6.3, 95% CI: 3.1–12.7). Illiteracy was least common amongst people with mental health conditions (aOR = 0.3, 95% CI: 0.1–0.9).

3.4. Work

People with disabilities were twice as likely not to be working compared to people without disabilities (aOR = 2.3, 95% CI: 1.6–3.5). Amongst people with disabilities, people with cognitive impairments were least likely to work (80% were out of work). Women with disabilities were less likely to working compared to men with disabilities (66.4% versus 55.6%), although this difference was not statistically significant. There was no difference in work status between Male' and other atolls.

3.5. Social Participation

For social participation, people with disabilities were less likely to have voted in the last election (aOR = 2.6, 95% CI: 1.5–4.5) and be involved in household decision-making (aOR = 3.4, 95% CI: 2.1–5.5) compared to people without disabilities. Amongst people with disabilities who did not vote, two-thirds reported that they did not vote because of reasons related to their disability. Amongst people with disabilities, people living in Male' and people with cognitive impairments were less likely to have voted.

People with disabilities were over four times more likely to report having experienced violence in the last 12 months compared to people without disabilities (aOR = 4.4, 95% CI: 2.8–6.9). Working-age adults with disabilities were more likely to have experienced violence compared to older adults with disabilities (31.0% vs. 14.7%, $p = 0.002$). Additionally, almost half (46.5%) of people with mental health conditions reported experiencing violence, which was significantly higher compared to people with other impairments ($p < 0.001$).

4. Discussion

Almost 7% of the population of the Maldives is estimated to have a disability. People with disabilities and their households were more likely to experience poverty and deprivation compared to people without disabilities, across the majority of included indicators. Overall, this research finds that people with disabilities are at risk of being left behind from progress across multiple SDG domains, including in combatting income poverty, food insecurity and exclusion from health, education, work and social participation, and vulnerability to violence.

Disability prevalence in the Maldives was higher than estimated in the 2016–2017 Maldives Demographic Health Survey (MDHS), which found a prevalence of 4% [20]. However, the MDHS used a binary question asking whether respondents “suffer from a disability”, which is likely underestimate disability prevalence and is not in line with the UNCRPD definition of disability [21–23]. Functioning-based approaches, such the Washington Group questions, are recommended over impairment-based approaches as they are more in line with current conceptualisations of disability and reduce underreporting linked to stigma and differing sociocultural definitions of disability [23].

Disparities between people with and without disabilities observed in this study are generally reflective of global trends. For example, several studies from low- and middle-income countries have also found people with disabilities face an increased risk of monetary poverty [2,24], violence [25,26], poor health [9,27], food insecurity [28] and lower access to education [7,9,29] and work [30]. Still, some observations in this research differed from previous research or expected trends. For example, people with disabilities tend to be at risk of impoverishing health spending, as they often have to pay for disability-related health services (e.g., rehabilitation, assistive devices)—which may not be covered in health insurance schemes—in addition to general healthcare [31,32]. However, in this study there was no difference in the likelihood of experiencing impoverishing health expenditures between people with and without disabilities, even though people with disabilities were more likely to have reported experiencing a health problem in the last 12 months. This lack of difference may reflect the strength of the universal national health insurance scheme *Aasanda* at minimising out-of-pocket healthcare payments, including for people with disabilities. Alternatively, people with disabilities may have forgone needed healthcare due to lack of availability of needed services, or an inability to pay for

them. More research is needed to explore access to and financing of healthcare amongst people with disabilities, including for disability-related services.

This research also highlights important differences amongst people with disabilities in their likelihood of experiencing different types of deprivations, depending on factors like gender, age, impairment type and location. The heterogeneity of experiences amongst people with disabilities highlights the need for wide-ranging policy and programmatic responses to address the diversity of needs and barriers to participation faced by people with disabilities.

For example, risk of poverty and deprivation differed amongst people with disabilities by impairment type. People with cognitive impairments were more likely to be deprived in indicators for food security, education, work and social participation compared to people with other impairment types. Other studies have also found people with cognitive impairments are less likely to work [33] and go to school [9] compared to people with other impairments. Additionally, people with mental health conditions fared comparatively well on indicators of education and work, but faced much higher levels of violence compared to people with other impairment types. The bidirectional association between violence and mental health has been well-established [25,34]. People with mental health impairments were also at increased risk of food insecurity compared to people with other impairments.

By location, living in Male' is associated with a decreased risk of income poverty and primary school non-completion amongst people with disabilities. This finding is mirrored in national trends in the general population of the Maldives, and likely reflects the higher salaries and concentration of services around the capital [20]. For example, most health, rehabilitation and social services are based in Male', access to which can improve functioning and participation. However, people with disabilities in Male' were less likely to vote compared to people with disabilities in other atolls. This difference may reflect universal challenges for people with and without disabilities in changing their residency status when they move from outer islands to Male' or greater voter drives in atolls outside of Male'.

By age, older adults tended to fare better on most indicators compared to children and working-age people with disabilities. For example, older adults were less likely to be living in food-insecure or income-poor households. This finding may reflect the positive impacts of the Maldives' Old Age Basic Pension, which provides MVR 5000 (USD 320) to all citizens aged 65+ who do not already receive a state-funded pension of similar value [35,36] and can be received concurrently with the Disability Allowance. Older adults with disabilities may also have experienced the onset of impairment after their working and schooling years, and so did not have to contend with disability-related barriers to participation. Older adults with disabilities, however, were less likely to have completed primary school compared to working-age people with disabilities. This trend has also been observed amongst the general population in the Maldives and is likely indicative of national improvements in education provision over time [20].

Few significant differences were found between women and men with disabilities, with the exception that women were less likely to be illiterate. Higher literacy amongst women with disabilities mirrors findings from the general population in the Maldives (literacy among 15–49 year olds, 99% in women vs. 96% in men) [20]. The lack of difference between men and women with disabilities stands somewhat in contrast to evidence from studies in other locations, where differences between men and women with disabilities are more apparent. For example, school attendance and attainment is often found to be lower amongst girls with disabilities compared to boys with disabilities [37,38], as is employment for women with disabilities compared to men with disabilities [30,33,37]. The lack of association in this study may reflect limitations of the study's power, as some of the observed differences were close to statistical significance (e.g., employment), or differences in the socio-cultural context of the Maldives compared to other study settings.

Strengths and Limitations

This study presents findings from a nationally-representative, population-based study on disability in the Maldives, which increases the generalisability of results and reduces potential sources of bias

inherent in other strategies of recruitment. Further, this study uses the Washington Group questions to measure disability, which is recommended by the United Nations and other bodies for international comparisons of disability, including for monitoring inclusion under the UNCRPD and SDGs [39–41].

Still, this study has several limitations that should be considered when interpreting its findings. For example, some analyses may not have been sufficiently powered to detect differences between people with and without disabilities, and amongst people with disabilities. In particular, analyses of children may be underpowered, and therefore null findings should be interpreted with caution. Further, this study uses cross-sectional data and so it is not possible to establish the direction of association (i.e., does disability increase the risk of deprivation or vice versa). For example, people with mental health impairments faced an increased risk of violence, health problems in the last 12 months and food insecurity. However, it not possible to determine whether deprivation in these areas led to poor mental health or poor mental health increased the risk of these deprivations. Further research to establish the directionality of association, as well as track changes in trends over time, is important for informing policy responses.

Additionally, many of the outcome indicators used in this study—and in SDG monitoring—may not sufficiently capture poverty and deprivation amongst people with disabilities. For example, the use of a universal poverty line does not account for the extra consumption needs of people with disabilities, who often must contend with additional expenses in order to participate (e.g., for assistive technology, personal assistance, additional transportation and health costs) [31]. Incorporating extra disability-related costs would substantially increase the proportion of people with disabilities living in poverty [31,42,43], and so current approaches to measuring income poverty through universal poverty lines are likely to underestimate poverty in people with disabilities.

Further, quality is a concern when assessing deprivations in access to services, employment and education, particularly for people with disabilities. For instance, school enrolment and attainment do not capture the quality of schooling, which is an important consideration for both children with and without disabilities. However, children with disabilities face an increased risk of poor quality schooling, as education systems often do not have resources in place to support their learning (e.g., instruction in Braille, sign language) [44,45]. Similarly, indicators on household access to improved WASH can mask difficulties people with disabilities face in using these services independently, hygienically, consistently and with dignity [46–48]. Disability-specific indicators, such as stigma and access to assistive technology and rehabilitation are also be needed to track important deprivations for people with disabilities.

5. Conclusions

Across the Maldives, people with disabilities and their households face an increased risk of poverty and other forms of deprivation compared to people without disabilities. Amongst people with disabilities, people with cognitive and mental health impairments, people living outside of Male', and children and working-age adults tended to face the highest levels of deprivation. Policy and programmatic change are needed to address disparities between people with and without disabilities to fulfil the SDG's mandate of "no one left behind." This may include targeted approaches (e.g., provision of assistive devices, rehabilitation and other disability-specific services) as well as mainstreaming disability across all development efforts (e.g., inclusive education, workplace accommodations). Additionally, disability-sensitive indicators of poverty and deprivation (e.g., poverty lines adjusted for disability-related extra costs, individual WASH access, inclusive work and education) are needed to more accurately capture progress towards full inclusion in the SDGs.

Supplementary Materials: The following are available online at <http://www.mdpi.com/2071-1050/12/5/2066/s1>, Table S1: Sampling weights.

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References

1. World Health Organization & World Bank. World Report on Disability: World Health Organization. 2011. Available online: https://www.who.int/disabilities/world_report/2011/en/. (accessed on 6 March 2020).
2. Banks, L.M.; Kuper, H.; Polack, S. Poverty and disability in low- and middle-income countries: A systematic review. *PLoS ONE* **2017**, *12*, e0189996. [CrossRef] [PubMed]
3. Banks, L.M.; Polack, S. The Economic Costs of Exclusion and Gains of Inclusion of People with Disabilities. International Centre for Evidence in Disability, 2014. Available online: https://www.cbm.org/fileadmin/user_upload/Publications/Costs-of-Exclusion-and-Gains-of-Inclusion-Report.pdf. (accessed on 29 September 2017).
4. Bright, T.; Wallace, S.; Kuper, H. A Systematic Review of Access to Rehabilitation for People with Disabilities in Low- and Middle-Income Countries. *Int. J. Environ. Res. Public Heal.* **2018**, *15*, 2165. [CrossRef] [PubMed]
5. United Nations. Convention on the Rights of Persons with Disabilities. 2006. Available online: https://www.un.org/disabilities/documents/convention/convention_accessible_pdf.pdf. (accessed on 6 March 2020).
6. United Nations. Convention on the Rights of Persons with Disabilities (CRPD) 2019. Available online: <https://www.un.org/development/desa/disabilities/convention-on-the-rights-of-persons-with-disabilities.html>. (accessed on 6 March 2020).
7. Mizunoya, S.; Mitra, S.; Yamasaki, I. Disability and school attendance in 15 low- and middle-income countries. *World Dev.* **2018**, *104*, 388–403. [CrossRef]
8. Bright, T.; Kuper, H. A Systematic Review of Access to General Healthcare Services for People with Disabilities in Low and Middle Income Countries. *Int. J. Environ. Res. Public Heal.* **2018**, *15*, 1879. [CrossRef]
9. Kuper, H.; Dok, A.M.-V.; Wing, K.; Danquah, L.; Evans, J.R.; Zuurmond, M.; Gallinetti, J. The Impact of Disability on the Lives of Children; Cross-Sectional Data Including 8,900 Children with Disabilities and 898,834 Children without Disabilities across 30 Countries. *PLoS ONE* **2014**, *9*, e107300. [CrossRef]
10. United Nations. Transforming our World: the 2030 Agenda for Sustainable Development. 2015. Available online: <https://sustainabledevelopment.un.org/post2015/transformingourworld/publication> (accessed on 6 March 2020).
11. Groce, N.E.; Trani, J.F. Millennium Development Goals and people with disabilities. *Lancet* **2009**, *374*, 1800–1801. [CrossRef]
12. Yeo, R.; Moore, K. Including Disabled People in Poverty Reduction Work: “Nothing About Us, Without Us.”. *World Dev.* **2003**, *31*, 571–590. [CrossRef]
13. Abualghaib, O.; Groce, N.E.; Simeu, N.; Carew, M.T.; Mont, D. Making Visible the Invisible: Why Disability-Disaggregated Data is Vital to “Leave No-One Behind.”. *Sustainability* **2019**, *11*, 3091. [CrossRef]
14. National Bureau of Statistics. Maldives Population and Housing Census 2014: Statistical Release 1. 205. Available online: <http://statisticsmaldives.gov.mv/nbs/wp-content/uploads/2015/10/Census-Summary-Tables1.pdf> (accessed on 28 February 2020).
15. Kuper, H.; Polack, S.; Limburg, H. Rapid assessment of avoidable blindness. *Community eye Heal.* **2006**, *19*, 68–69.

16. Marella, M.; Busija, L.; Islam, F.M.A.; Devine, A.; Fotis, K.; Baker, S.; Sprunt, B.; Edmonds, T.; Huq, N.L.; Cama, A.; et al. Field-testing of the rapid assessment of disability questionnaire. *BMC Public Heal.* **2014**, *14*, 900. [CrossRef]
17. Marella, M.; Devine, A.; Armecin, G.F.; Zayas, J.; Marco, M.J.; Vaughan, C. Rapid assessment of disability in the Philippines: understanding prevalence, well-being, and access to the community for people with disabilities to inform the W-DARE project. *Popul. Heal. Metrics* **2016**, *14*, 26. [CrossRef] [PubMed]
18. Washington Group on Disability Statistics. Washington Group—Extended Question Set on Functioning (WG ES-F) 2011. Available online: http://www.washingtongroup-disability.com/wp-content/uploads/2016/01/WG_Extended_Question_Set_on_Functioning.pdf. (accessed on 3 June 2019).
19. Washington Group on Disability Statistics, UNICEF. Child Functioning for Children Age 5 to 17. 2016. Available online: <https://data.unicef.org/resources/module-child-functioning/>. (accessed on 3 June 2019).
20. Ministry of Health [Maldives], ICF. Maldives Demographic and Health Survey 2016-17. Male, Maldives and Rockville, Maryland, USA: MOH and ICF, 2018. Available online: <https://dhsprogram.com/pubs/pdf/FR349/FR349.pdf> (accessed on 25 January 2019).
21. Loeb, M.; Eide, A.H.; Mont, D. Approaching the measurement of disability prevalence: The case of Zambia. *Alter* **2008**, *2*, 32–43. [CrossRef]
22. Mont, D. Measuring health and disability. *Lancet* **2007**, *369*, 1658–1663. [CrossRef]
23. Palmer, M.; Harley, D. Models and measurement in disability: an international review. *Heal. Policy Plan.* **2011**, *27*, 357–364. [CrossRef]
24. Mitra, S.; Posarac, A.; Vick, B. Disability and Poverty in Developing Countries: A Multidimensional Study. *World Dev.* **2013**, *41*, 1–18. [CrossRef]
25. Devries, K.; Kyegombe, N.; A Zuurmond, M.; Parkes, J.; Child, J.C.; Walakira, E.J.; Naker, D. Violence against primary school children with disabilities in Uganda: a cross-sectional study. *BMC Public Heal.* **2014**, *14*, 1017. [CrossRef]
26. Hughes, K.; Bellis, M.A.; Jones, L.; Wood, S.; Bates, G.; Eckley, L.; McCoy, E.; Mikton, C.R.; Shakespeare, T.; Officer, A. Prevalence and risk of violence against adults with disabilities: A systematic review and meta-analysis of observational studies. *Lancet* **2012**, *379*, 1621–1629. [CrossRef]
27. MacTaggart, I.; Kuper, H.; Murthy, G.V.S.; Sagar, J.; Oye, J.; Polack, S. Assessing health and rehabilitation needs of people with disabilities in Cameroon and India. *Disabil. Rehabilitation* **2015**, *38*, 1–8. [CrossRef]
28. Pinilla-Roncancio, M. The reality of disability: Multidimensional poverty of people with disability and their families in Latin America. *Disabil. Heal. J.* **2018**, *11*, 398–404. [CrossRef]
29. Filmer, D. Disability, Poverty, and Schooling in Developing Countries: Results from 14 Household Surveys. *World Bank Econ. Rev.* **2008**, *22*, 141–163. [CrossRef]
30. Mizunoya, S.; Mitra, S. Is There a Disability Gap in Employment Rates in Developing Countries? *World Dev.* **2013**, *42*, 28–43. [CrossRef]
31. Mitra, S.; Palmer, M.; Kim, H.; Mont, D.; Groce, N.E. Extra costs of living with a disability: A review and agenda for research. *Disabil. Heal. J.* **2017**, *10*, 475–484. [CrossRef] [PubMed]
32. Palmer, M. Inequalities in Universal Health Coverage: Evidence from Vietnam. *SSRN Electron. J.* **2014**, *64*, 384–394.
33. MacTaggart, I.; Banks, L.M.; Kuper, H.; Murthy, G.V.S.; Sagar, J.; Oye, J.; Polack, S. Livelihood opportunities amongst adults with and without disabilities in Cameroon and India: A case control study. *PLoS ONE* **2018**, *13*, e0194105. [CrossRef]
34. Ellsberg, M.; Jansen, H.A.; Heise, L.; Watts, C.H.; Garcia-Moreno C. Intimate partner violence and women’s physical and mental health in the WHO multi-country study on women’s health and domestic violence: An observational study. *Lancet* **2008**, *371*, 1165–1172. [CrossRef]
35. Shahid, A. Ageing with Dignity: Old-Age Pension Schemes from the Perspective of the Right to Social Security Under ICESCR. *Hum. Rights Rev.* **2014**, *15*, 455–471. [CrossRef]
36. Government of the Maldives. Basic Pension Male’, Maldives 2019. Available online: <https://en.pension.gov.mv/scheme/basic-pension-scheme-en> (accessed on 21 August 2019).
37. Mitra, S. *Disability, Health and Human Development*; Springer: Berlin, Germany, 2017; p. 105.
38. Trani, J.-F.; VanLeit, B. *Increasing inclusion of persons with disabilities: Reflections from disability research using the ICF in Afghanistan and Cambodia*; Leonard Cheshire, UCL: London, UK, 2010.

39. Altman, B.M. International Measurement of Disability: Purpose, Measure and Application. The Work of the Washington Group. *Soc. Indic. Res. Ser.* **2016**, *61*, 2016.
40. Rieger, J.; Stanley, J.; Traynor, R.; Traynor, R. Monitoring and Evaluation. In *Project Planning and Management for Ecological Restoration*; Springer Science and Business Media LLC: Berlin, Germany, 2014; pp. 203–214.
41. Mactaggart, I.; Kuper, H.; Murthy, G.; Oye, J.; Polack, S. Measuring disability in population based surveys: The interrelationship between clinical impairments and reported functional limitations in Cameroon and India. *PLoS ONE* **2016**, *11*, e0164470. [[CrossRef](#)]
42. Palmer, M.; Williams, J.; McPake, B. Standard of Living and Disability in Cambodia. *J. Dev. Stud.* **2018**, *55*, 2382–2402. [[CrossRef](#)]
43. Hoang, V.M.; Giang, K.B.; Liem, N.T.; Palmer, M.; Thao, N.P.; Duong, L.B. Estimating the extra cost of living with disability in Vietnam. *Glob. Public Heal.* **2014**, *10*, S70–S79.
44. Banks, L.M.; Zuurmond, M. *Barriers and Enablers to Inclusion in Education for Children with Disabilities in Malawi*; Norwegian Association of Disabled: Oslo, Norway, 2015. Available online: https://www.lshtm.ac.uk/sites/default/files/2019-06/Barriers-enablers-inclusion-Malawi_0.pdf (accessed on 10 November 2018).
45. Banks, L.M.; Zuurmond, M.; Monteath–Van Dok, A.; Gallinetti, J.; Singal, N. Perspectives of children with disabilities and their guardians on factors affecting inclusion in education in rural Nepal: “I feel sad that I can’t go to school”. *Oxf. Dev. Stud.* **2019**, *47*, 289–303. [[CrossRef](#)]
46. Banks, L.M.; White, S.; Biran, A.; Wilbur, J.; Neupane, S.; Neupane, S.; Sharma, A.; Kuper, H. Are current approaches for measuring access to clean water and sanitation inclusive of people with disabilities? Comparison of individual- and household-level access between people with and without disabilities in the Tanahun district of Nepal. *PLoS ONE* **2019**, *14*, e0223557. [[CrossRef](#)] [[PubMed](#)]
47. Kuper, H.; MacTaggart, I.; White, S.; Dionicio, C.; Cañas, R.; Naber, J.; Polack, S.; Biran, A. Exploring the links between water, sanitation and hygiene and disability; Results from a case-control study in Guatemala. *PLoS ONE* **2018**, *13*, e0197360. [[CrossRef](#)] [[PubMed](#)]
48. White, S.; Kuper, H.; Itimu-Phiri, A.; Holm, R.; Biran, A. A Qualitative Study of Barriers to Accessing Water, Sanitation and Hygiene for Disabled People in Malawi. *PLoS ONE* **2016**, *11*, e0155043. [[CrossRef](#)] [[PubMed](#)]



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