



Article

Differences in Health Status between People with and without Disabilities in Ecuadorian Prisons

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Abstract: People with disabilities experience significant health inequalities and inequities compared to people without disabilities. However, there is little evidence on the frequency of health conditions and their association with disability in the prison context. The aim of this study was to compare the proportions and associations between various health conditions and different disability indicators. A secondary analysis of existing data from the Ecuador Prison Census 2022 was conducted. The variable of interest was based on three disability indicators from the six-item Washington Group Short Set on Functioning. A cross-tabulation was carried out to estimate the proportion of prisoners with different disability indicators by gender. These proportions were also calculated for different health conditions. Moreover, we analyzed the association between each of the three disability indicators and the different health conditions using multivariable logistic regression. A total of 30,612 incarcerated persons were included in the analysis, revealing that 8% had disabilities. According to gender, a higher proportion of women had disabilities (10.7% vs. 8.5%), some difficulty functioning (33.8% vs. 28.0%), and multiple disabilities (2.4% vs. 2.0%) compared to men. Furthermore, people with disabilities had a higher proportion of health conditions compared to those without a disability. Strong and very strong evidence of associations were found between different disability indicators and several health conditions, while a lower odds of drug use was observed in people with disabilities and multiple disabilities compared to their counterparts, and no evidence of association was found with Human Immunodeficiency Virus (HIV) infection. Our results reflect the health inequalities and inequities experienced by prisoners with disabilities. This highlights the need to implement targeted policies within prisons and to include prisoners with disabilities in the country's agenda.

Keywords: people with disabilities; prisons; health inequalities; Ecuador



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1. Introduction

Prisons are an unfavorable and transitional environment for most people deprived of their liberty, contributing to the development of health inequalities [1]. Despite the efforts of the World Health Organization (WHO) to improve health conditions in prisons [2], health inequalities remain a difficult challenge to address in these institutions, leading to worse health conditions in incarcerated persons compared to the general population [3]. Several epidemiological studies have shown that incarcerated persons have higher prevalence of chronic and infectious diseases compared to the general population due to the scarcity of prevention, control services, and adequate therapeutic measures, especially in low- and middle-income countries [4,5].

While health inequalities affect the entire prison population, they are further compounded for specific populations, such as people with disabilities, due to socio-demographic characteristics, including gender and ethnicity, as well as systemic, environmental, and attitudinal barriers [4–6]. Indeed, people with disabilities experience a greater vulnerability compared to the general population outside the prison context due to system- and

individual-level barriers that limit their access to health services [7]. This specific population faces condition-specific limitations that reduce their ability to engage in physical activity, maintain adequate nutrition, or even perform activities of daily life, resulting in a worse health status [8,9]. In a prison setting, these problems are accentuated by additional constraints, such as the scarcity of physical accessibility in prison facilities, the inadequate training of prison staff to address the needs of the people with disabilities, and a lack of specialized services to prevent or treat various health problems [10].

In Latin America and the Caribbean, prisons are overcrowded and in precarious conditions. Between 2000 and 2018, it is estimated that the number of incarcerated persons increased by 120%, with South America experiencing the highest population growth (200%) [11]. However, prison overcrowding is inversely related to the level of access to health services [12,13], and it is a detrimental factor that decreases the well-being of people and increases the risk of suffering from chronic or infectious diseases [12,13]. This situation, combined with the inherent vulnerability of people with disabilities, increases health inequities which result in higher proportions of health conditions among prisoners with disabilities compared to their non-disabled counterparts [14]. However, still little is known about the health status of prisoners with disabilities in South American countries like Ecuador. This lack of evidence hinders the establishment of effective interventions to control and prevent health conditions, particularly in people with disabilities who have specific needs and vulnerabilities.

The scarcity of quality records or information on the health conditions of people with disabilities is a common problem in various regions of the world, limiting the epidemiological picture of this population [15]. These shortcomings are observed in different settings such as prisons, where the availability of reliable data is even scarcer. However, there are some prison censuses that are used to conduct epidemiological studies and help in the formulation and implementation of health policies in unfavorable settings [16,17]. In Ecuador, the latest Prison Census, performed in 2022, allows the assessment of the health conditions of incarcerated persons and provides socio-demographic and health information on vulnerable groups, such as people with disabilities [18]. Therefore, we aimed to compare the proportions and association between various health conditions with different disability indicators, using the 2022 Prison Census in Ecuador.

2. Materials and Methods

2.1. Data Source

This study is a secondary analysis using data from the 2022 Prison Census in Ecuador. The census was conducted by the National Institute of Statistics and Census (INEC) between 22 August and 10 December 2022. The primary aim of the census was to acquire statistical insights into the national prison population, contributing to the formulation of public policies and enhancing the social rehabilitation and reintegration of inmates.

The census focused on the 36 existing National Prison Centers. Data were collected through in-person interviews conducted by trained interviewers on mobile devices. Pilot tests were conducted in two prison centers on 20 and 21 December 2021 (Cotopaxi No. 1), and between 6 and 15 April 2022 (Azuay No. 1), resulting in adjustments to the collection instruments and operational processes.

2.2. Study Population

The census enrolled 31,321 individuals aged 18 years or older, consisting of 29,356 men and 1965 women. After removing 42 individuals with incomplete interviews and 667 individuals with incomplete information on the variables of interest, we finally included 30,612 study participants.

2.3. Variables

We created three disability indicators based on all six items from the Washington Group Short Set (WG-SS) on Functioning that were included in the census. Each of these

items represents a domain-specific measure of difficulty: (1) mobility: “Do you have permanent difficulty in walking, or climbing or descending stairs?”; (2) self-care: “Do you have permanent difficulty with bathing, dressing, or feeding yourself?”; (3) communication: “Do you have permanent difficulty in speaking, communicating, or conversing?”; (4) hearing: “Do you have permanent difficulty in hearing, even when using hearing aids?”; (5) vision: “Do you have permanent difficulty in seeing, even when wearing glasses?”; and (6) cognition: “Do you have permanent difficulty in remembering, understanding, or concentrating?”. These items were self-reported by the respondents and did not take into account a formal diagnosis made by a healthcare professional. The response options for each item were presented on a Likert scale and included the following: no difficulty, some difficulty, a lot of difficulty, and total difficulty.

Following the methodology of the Washington Group on Disability Statistics [19], an “overall disability status” indicator was developed to classify the surveyed population into those with and without disabilities, categorizing people who reported a lot of difficulty or total difficulty in at least one domain as having a disability. Moreover, two supplementary indicators were created to categorize disability at varying levels [19,20]: (i) “some difficulty functioning”, which includes people with a lower threshold of disability (some difficulty or more in at least one domain); and (ii) “multiple disabilities”, which identifies people with greater severity of disability and higher healthcare needs (a lot of difficulty or total difficulty in two or more domains).

We also created variables on the self-reported medical diagnoses of health conditions, such as hypertension (no, yes), diabetes (no, yes), cancer (no, yes), bronchitis or pneumonia (no, yes), tuberculosis (no, yes), human immunodeficiency virus (HIV) infection (no, yes), COVID-19 (no, yes), co-occurrence of hypertension and diabetes (no, yes), co-occurrence of HIV infection and tuberculosis (no, yes), attempted suicide since admission (no, yes), and drug use in the last 12 months (no, yes).

Other variables were created: gender (male, female), age (60+, 30–59, 18–29 years), country of birth (Ecuador, Outside Ecuador), ethnicity was classified according to the culture or customs with which the participants identified themselves (Other, African descent, indigenous), educational level according to the highest level attained (up to primary, secondary, higher), and the time deprived of liberty (<6 months, 6 months to <2 years, 2 years or more).

2.4. Data Processing and Analysis

After the data import process was completed, data cleaning, recoding, and the creation of new variables were performed using R version 4.0.2. The study used descriptive statistics to report the frequency of the disability indicators among Ecuadorian prisoners. A cross-tabulation was carried out to estimate the proportion of prisoners with different disability indicators by gender. Cross-tabulations between the different disability indicators and health conditions were also calculated. The results were presented as medians and interquartile ranges (IQRs) for the continuous variables (according to the non-normal distribution of the variable) or as percentages for the categorical variables.

We also analyzed the association between each of the three disability indicators and the different health conditions using multivariable logistic regression. Each model obtained was adjusted for the a priori confounders (gender, age, and ethnicity) that met the following criteria: (i) to be associated with the independent variable, (ii) to be independently associated with the outcome variable, and (iii) not to be in the causal pathway of each of the associations of interest. Adjusted odds ratios (aORs) were calculated with 95% confidence intervals (95% CIs). The results were presented in a forest plot using the *ggforestplot* package. The cut-off points of the *p*-value were considered to determine the strength of the evidence for the effect estimates: very strong (<0.001), strong (<0.01), some (<0.05), weak (<0.10), and no evidence (>0.10) of association.

2.5. Ethical Considerations

This study was a secondary analysis of publicly available anonymized data, and no ethical approval was required. The database can be obtained freely from: https://www.ecuadorencifras.gob.ec/documentos/web-inec/Poblacion_y_Demografia/Censo_penitenciario%20/2023/Base_de_datos_CP_2022.zip (accessed on 23 February 2024).

3. Results

We included 30,612 incarcerated persons in the study. Of the inmates included, most were male (93.8%) and had a median age of 32 years (IQR: 26–40). In terms of functional difficulties, 3.8% had permanent difficulty in moving around, 1.2% in performing the activities of daily life, 0.3% in communicating, 1.1% in hearing, 3.5% in seeing, and 1.5% in remembering, understanding, or concentrating. Further details on the characteristics of the sample are shown in Table 1.

Table 1. Characteristics of the study population.

Variable	n (%)
Gender	
Male	28,703 (93.8)
Female	1909 (6.2)
Age (years)	
Median [IQR]	32.0 (26–40)
Age group	
60 or older	1048 (3.4)
30–59	17,154 (56.0)
18–29	12,410 (40.5)
Country of birth	
Ecuador	27,449 (89.7)
Outside Ecuador	3163 (10.3)
Ethnicity	
Other	22,936 (74.9)
African descent	6544 (21.4)
Indigenous	1132 (3.7)
Educational level	
Up to primary	6214 (20.3)
Secondary	22,053 (72.0)
Higher	2345 (7.7)
Time deprived of liberty	
<6 months	5769 (18.8)
6 months to <2 years	10,322 (33.7)
≥2 years	14,521 (47.4)
Permanent difficulty walking, or going up or down stairs *	
No	29,436 (96.2)
Yes	1176 (3.8)
Permanent difficulty bathing, dressing, or feeding self *	
No	30,258 (98.8)
Yes	354 (1.2)
Permanent difficulty in speaking, communicating, or conversing *	
No	30,508 (99.7)
Yes	104 (0.3)
Permanent difficulty hearing, even when wearing a hearing aid *	
No	30,261 (98.9)
Yes	351 (1.1)
Permanent difficulty in seeing, even when wearing glasses *	
No	29,535 (96.5)
Yes	1077 (3.5)
Permanent difficulty in remembering, understanding, or concentrating *	
No	30,162 (98.5)
Yes	450 (1.5)

* The category “Yes” corresponds to whether the person has a lot or total difficulty, and “No” indicates that he/she has no difficulty or some difficulty. IQR: interquartile range.

The largest proportion of the prison population reported no difficulties across all of the domain-specific measures of disability. Based on the overall disability status, 8.6% were people with disabilities, while 91.4% were people without disabilities. Moreover,

28.4% and 2.0% of the prison population had some difficulty functioning or multiple disabilities, respectively (Table 2). According to gender, a higher proportion of women were categorized as people with disabilities compared to men (10.7% vs. 8.5%). The same pattern was observed with the other two indicators: some difficulty functioning (33.8% vs. 28.0% [in men]) and multiple disabilities (2.4% vs. 2.0% [in men]). Furthermore, women had more severe limitations in mobility; seeing; and remembering, understanding, or concentrating compared to men (Table 2).

Table 2. Type and severity of disability by gender of incarcerated people.

Variable	Male (n = 28,703)	Female (n = 1909)	Overall (n = 30,612)
Permanent difficulty walking, or going up or down stairs			
No difficulty	25,080 (87.4)	1650 (86.4)	26,730 (87.3)
Some difficulty	2541 (8.9)	165 (8.6)	2706 (8.8)
A lot of difficulty	1007 (3.5)	87 (4.6)	1094 (3.6)
Total difficulty	75 (0.3)	7 (0.4)	82 (0.3)
Permanent difficulty bathing, dressing, or feeding self			
No difficulty	27,499 (95.8)	1841 (96.4)	29,340 (95.8)
Some difficulty	871 (3.0)	47 (2.5)	918 (3.0)
A lot of difficulty	300 (1.0)	15 (0.8)	315 (1.0)
Total difficulty	33 (0.1)	6 (0.3)	39 (0.1)
Permanent difficulty in speaking, communicating, or conversing			
No difficulty	27,916 (97.3)	1868 (97.9)	29,784 (97.3)
Some difficulty	687 (2.4)	37 (1.9)	724 (2.4)
A lot of difficulty	87 (0.3)	3 (0.2)	90 (0.3)
Total difficulty	13 (0.0)	1 (0.1)	14 (0.0)
Permanent difficulty hearing, even when wearing a hearing aid			
No difficulty	26,992 (94.0)	1815 (95.1)	28,807 (94.1)
Some difficulty	1374 (4.8)	80 (4.2)	1454 (4.7)
A lot of difficulty	324 (1.1)	13 (0.7)	337 (1.1)
Total difficulty	13 (0.0)	1 (0.1)	14 (0.0)
Permanent difficulty in seeing, even when wearing glasses			
No difficulty	24,677 (86.0)	1535 (80.4)	26,212 (85.6)
Some difficulty	3051 (10.6)	272 (14.2)	3323 (10.9)
A lot of difficulty	928 (3.2)	102 (5.3)	1030 (3.4)
Total difficulty	47 (0.2)	0 (0)	47 (0.2)
Permanent difficulty in remembering, understanding, or concentrating			
No difficulty	25,788 (89.8)	1626 (85.2)	27,414 (89.6)
Some difficulty	2501 (8.7)	247 (12.9)	2748 (9.0)
A lot of difficulty	401 (1.4)	36 (1.9)	437 (1.4)
Total difficulty	13 (0.0)	0 (0)	13 (0.0)
Some difficulty functioning			
No	20,667 (72.0)	1263 (66.2)	21,930 (71.6)
Yes	8036 (28.0)	646 (33.8)	8682 (28.4)
Overall disability status			
Without disabilities	26,277 (91.5)	1705 (89.3)	27,982 (91.4)
With disabilities	2426 (8.5)	204 (10.7)	2630 (8.6)
Multiple disabilities			
No	28,133 (98.0)	1864 (97.6)	29,997 (98.0)
Yes	570 (2.0)	45 (2.4)	615 (2.0)

Some difficulty functioning: some difficulty or more in at least one domain. Overall disability status: a lot of difficulty or total difficulty in at least one domain. Multiple disabilities: a lot of difficulty or total difficulty in two or more domains.

Table 3 shows that people with disabilities had a higher proportion of most physical and mental health conditions compared to those without disabilities, with the exception of “the co-occurrence of HIV infection and tuberculosis” and “drug use in the last 12 months” variables. The same pattern was observed among people with multiple disabilities. On the other hand, people with some difficulty functioning had a higher proportion of most physical and mental health conditions, with the exception of “drug use in the last 12 months” variable, which was more prevalent among their counterparts.

Table 3. Comparison of health conditions between incarcerated people with disability indicators.

Variable	Some Difficulty Functioning		Overall Disability Status		Multiple Disabilities		
	Overall (n = 30,612)	No (n = 21,930)	Yes (n = 8682)	Without Disabilities (n = 27,982)	With Disabilities (n = 2630)	No (n = 29,997)	Yes (n = 615)
Hypertension							
No	27,292 (89.2)	20,536 (93.6)	6756 (77.8)	25,396 (90.8)	1896 (72.1)	26,928 (89.8)	364 (59.2)
Yes	3320 (10.8)	1394 (6.4)	1926 (22.2)	2586 (9.2)	734 (27.9)	3069 (10.2)	251 (40.8)
Diabetes							
No	29,367 (95.9)	21,395 (97.6)	7972 (91.8)	27,040 (96.6)	2327 (88.5)	28,873 (96.3)	494 (80.3)
Yes	1245 (4.1)	535 (2.4)	710 (8.2)	942 (3.4)	303 (11.5)	1124 (3.7)	121 (19.7)
Cancer							
No	30,449 (99.5)	21,867 (99.7)	8582 (98.8)	27,866 (99.6)	2583 (98.2)	29,857 (99.5)	592 (96.3)
Yes	163 (0.5)	63 (0.3)	100 (1.2)	116 (0.4)	47 (1.8)	140 (0.5)	23 (3.7)
Bronchitis or pneumonia							
No	30,081 (98.3)	21,709 (99.0)	8372 (96.4)	27,584 (98.6)	2497 (94.9)	29,520 (98.4)	561 (91.2)
Yes	531 (1.7)	221 (1.0)	310 (3.6)	398 (1.4)	133 (5.1)	477 (1.6)	54 (8.8)
Tuberculosis							
No	29,175 (95.3)	20,952 (95.5)	8223 (94.7)	26,698 (95.4)	2477 (94.2)	28,604 (95.4)	571 (92.8)
Yes	1437 (4.7)	978 (4.5)	459 (5.3)	1284 (4.6)	153 (5.8)	1393 (4.6)	44 (7.2)
HIV infection							
No	30,403 (99.3)	21,794 (99.4)	8609 (99.2)	27,793 (99.3)	2610 (99.2)	29,793 (99.3)	610 (99.2)
Yes	209 (0.7)	136 (0.6)	73 (0.8)	189 (0.7)	20 (0.8)	204 (0.7)	5 (0.8)
COVID-19							
No	28,866 (94.3)	21,030 (95.9)	7836 (90.3)	26,511 (94.7)	2355 (89.5)	28,333 (94.5)	533 (86.7)
Yes	1746 (5.7)	900 (4.1)	846 (9.7)	1471 (5.3)	275 (10.5)	1664 (5.5)	82 (13.3)
Hypertension and diabetes							
No	29,794 (97.3)	21,638 (98.7)	8156 (93.9)	27,403 (97.9)	2391 (90.9)	29,286 (97.6)	508 (82.6)
Yes	818 (2.7)	292 (1.3)	526 (6.1)	579 (2.1)	239 (9.1)	711 (2.4)	107 (17.4)
HIV infection and tuberculosis							
No	30,582 (99.9)	21,915 (99.9)	8667 (99.8)	27,955 (99.9)	2627 (99.9)	29,967 (99.9)	615 (100)
Yes	30 (0.1)	15 (0.1)	15 (0.2)	27 (0.1)	3 (0.1)	30 (0.1)	0 (0)
Suicide attempt							
No	28,106 (91.8)	20,557 (93.7)	7549 (87.0)	25,883 (92.5)	2223 (84.5)	27,609 (92.0)	497 (80.8)
Yes	2506 (8.2)	1373 (6.3)	1133 (13.1)	2099 (7.5)	407 (15.5)	2388 (8.0)	118 (19.2)
Drug use in the last 12 months							
No	23,446 (76.6)	16,456 (75.0)	6990 (80.5)	21,245 (75.9)	2201 (83.7)	22,902 (76.3)	544 (88.5)
Yes	7166 (23.4)	5474 (25.0)	1692 (19.5)	6737 (24.1)	429 (16.3)	7095 (23.7)	71 (11.5)

Some difficulty functioning: some difficulty or more in at least one domain. Overall disability status: a lot of difficulty or total difficulty in at least one domain. Multiple disabilities: a lot of difficulty or total difficulty in two or more domains. HIV: human immunodeficiency virus.

Very strong and strong evidence of associations were found between the different disability indicators and several health conditions (Figure 1 and Table S1 of the Supplementary Material). All the analyses presented were adjusted for the participants’ gender, age, and ethnicity. The aORs showed that people with disabilities had 126% higher

odds of hypertension (aOR: 2.26, 95% CI: 2.03–2.50, $p < 0.001$), 124% higher odds of diabetes (aOR: 2.24, 95% CI: 1.94–2.59, $p < 0.001$), 170% higher odds of cancer (aOR: 2.70, 95% CI: 1.87–3.86, $p < 0.001$), 184% higher odds of bronchitis (aOR: 2.84, 95% CI: 2.30–3.50, $p < 0.001$), 29% higher odds of tuberculosis (aOR: 1.29, 95% CI: 1.08–1.54, $p = 0.004$), 58% higher odds of COVID-19 (aOR: 1.58, 95% CI: 1.37–1.82, $p < 0.001$), and 114% higher odds of attempting suicide (aOR: 2.14, 95% CI: 1.90–2.40, $p < 0.001$) compared to prisoners without disabilities. Moreover, the co-occurrence of chronic conditions (hypertension and diabetes) and infectious diseases (HIV infection and tuberculosis) was positively associated with the presence of disability.

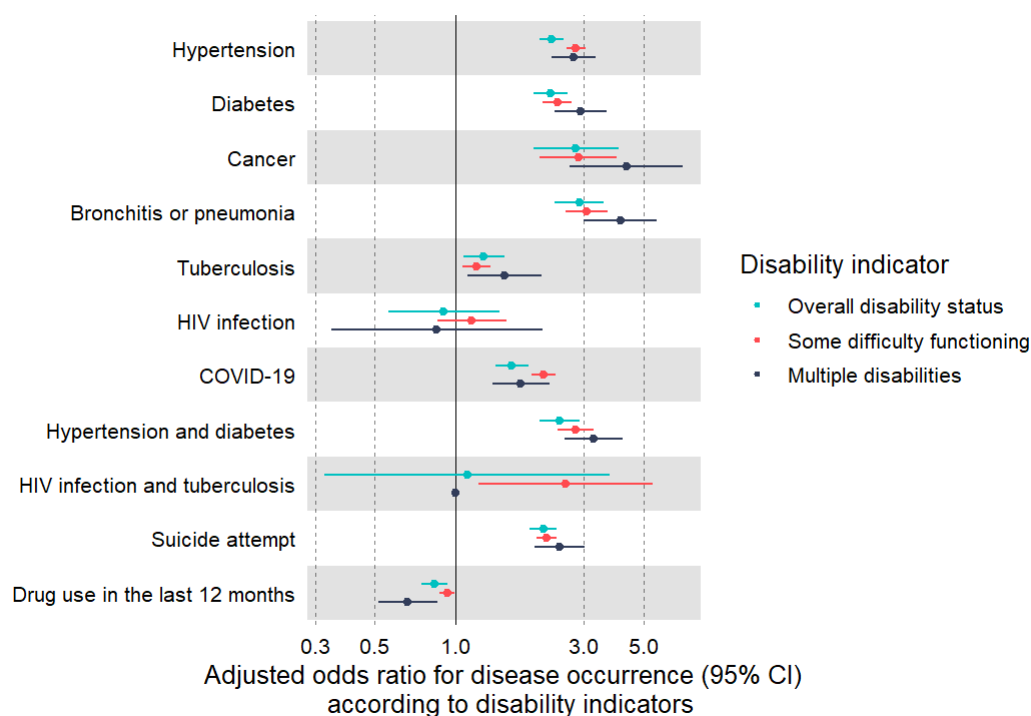


Figure 1. Forest plot of associations between disability indicators and health conditions in incarcerated people. HIV: human immunodeficiency virus.

In addition, people with some difficulty functioning and multiple disabilities also had higher odds of several health conditions compared to their counterparts. Those with “multiple disabilities” faced even greater odds for certain conditions, such as cancer (aOR: 3.99, 95% CI: 2.40–6.36, $p < 0.001$) and bronchitis or pneumonia (aOR: 3.91, 95% CI: 2.84–5.28, $p < 0.001$). Conversely, a lower odds of drug use in the last 12 months was observed in people with disabilities and multiple disabilities compared to their counterparts. Finally, people with disabilities and multiple disabilities had no evidence of association with HIV infection (Figure 1). The specific aORs, confidence intervals, and p -values can be found in Table S1 of the Supplementary Material.

4. Discussion

Based on our results, 8 out of 100 people in Ecuadorian prisons had disabilities, and 2 out of 100 had multiple disabilities. A larger proportion of prisoners (28.4%) were classified as having some difficulty functioning due to the use of a lower threshold for assessment. Regarding the gender of the inmates, a higher proportion of women had disabilities, some difficulty functioning, and multiple disabilities compared to men. The prison population (regardless of the gender) with disabilities, some difficulty functioning, and multiple disabilities had a higher proportion of health outcomes compared to their counterparts. In addition, people with disabilities, some difficulty functioning, and multiple disabilities had higher odds of health conditions (hypertension, diabetes, cancer, bronchitis, tuberculosis,

COVID-19, and suicide attempt) and lower odds of drug use in the last 12 months compared to their counterparts.

It was found that 8% of the inmates in Ecuadorian prisons had disabilities, 28% had some difficulty functioning, and 2% had multiple disabilities. This results complement the official report of the Prison Census in Ecuador, which provides a descriptive account of each individual disability-related question and the overall disability status but does not present an aggregated measure for the other disability indicators [18]. People with disabilities face a disproportionately higher burden of health conditions compared to their counterparts. This aligns with existing evidence in the United States and other contexts, which has consistently shown that incarcerated people with disabilities have poorer health outcomes and lower levels of well-being due to systemic barriers, including inadequate access to healthcare, discrimination, and a lack of disability-friendly facilities [14]. This study highlights that when people with disabilities are incarcerated, they lose economic and social support, which results in greater limitations in accessing the health care system, even after being released from prison [14]. In Ecuador, a report by the Permanent Committee for the Defense of Human Rights in 2021, based on a prison crisis, highlighted several limitations faced by incarcerated persons [21]. These limitations are related to the problems of institutional budgets to control social violence in prisons and the lack of a public policy with a human rights approach. This lack of public policy affects not only people with disabilities in the community setting but also those in prisons to an even greater extent, thereby limiting their access to healthcare and rehabilitation services during their imprisonment [22]. Furthermore, our study suggests broader implications for public health and prison reform. Addressing health disparities in prisons not only improves the well-being of incarcerated individuals but also contributes to public health, as most prisoners eventually re-enter the community.

Based on the gender of the inmates, a higher proportion of women was found across the different disability indicators. This result is similar to that reported in studies of people with disabilities in Puerto Rico and the United States [23,24], in which women were reported to have a higher prevalence of disability compared to men. The WHO 2022 Global Report on Health Equity for Persons with Disabilities also reported a similar pattern, indicating that women have a higher prevalence of disability [22]. Although these findings are not related to the prison setting, they highlight gender inequalities that expose women with disabilities to worse health conditions [25]. In prison settings, a review conducted by Wright et al. indicated that women are more affected by victimization, substance abuse, and physical and mental health problems compared to men [26]. According to the United Nations Office on Drugs and Crime, women are more vulnerable than men in prisons due to discrimination, abuse or violence, unmet health needs, extreme distress, and inequalities in terms of justice [27].

Prisoners with disabilities, some difficulty functioning, and a greater number and severity of disabilities, have a higher proportion of health conditions compared to their counterparts. This result is similar to those reported in studies in the United States and the Netherlands [28,29], wherein people with disabilities were reported to have multiple health conditions compared to those without disabilities, and people with more than one disability were more likely to have worse health conditions compared to those with a single disability. Our result highlights that while some of these conditions could lead to disability in people, these conditions may occur as secondary conditions in those who have previously had disabilities [30]. In people with disabilities, limitations inherent to their condition, such as a lack of physical activity, difficulty performing the activities of daily life, and the barriers they face in accessing health care, facilitate the development of chronic diseases [8,9]. In the prison setting, the health care needs of this population are not met in a continuous and adequate manner, which increases the risk of developing various diseases [6]. Imprisonment generates a higher transmissibility of infectious diseases among the prison population, resulting in a greater number of infections [4], especially in people

with disabilities due to the lack of preventative interventions and the discrimination they receive [6].

Prisoners with disabilities, some difficulty functioning, and multiple disabilities had higher odds of multi-morbidities (such as hypertension, diabetes, cancer, bronchitis, tuberculosis, COVID-19, and suicide attempts) compared to their counterparts. A systematic review conducted by Vancampfort et al. that included 55,548 people with disabilities indicated that these individuals had more than twice the odds of diabetes (aOR: 2.46, 95% CI: 1.89–3.21) compared to people without disabilities [31]. Similar results were reported for other health conditions such as hypertension, cancer outcomes, COVID-19, tuberculosis, and suicide attempts in community settings [32–35]. In prison settings, there is little evidence for the association between disability and health conditions. A study conducted by Dias et al. found no statistical evidence of an association between intellectual disability and self-reported medical conditions such as hypertension, diabetes, and other cardiovascular risk factors [36]. The only result with some statistical evidence showed that people with intellectual disabilities had nearly twice the odds of epilepsy or seizures (aOR: 1.9, 95% CI: 1.1–3.4) compared to prisoners without intellectual disabilities. In addition, a study conducted by Barry et al. reported an association between functional disability and suicidal ideation in older prisoners in United States [37]. People with disabilities in prisons face constant challenges in accessing healthcare services and managing the multiple comorbidities that may arise from their condition. Effective actions are needed to improve health conditions for this population and reduce the burden of disease caused by preventable illnesses.

One of the main strengths of our study was the use of census data that allowed the epidemiological studies to be carried out using information from the total Ecuadorian prison population. Another strength was the study of three disability indicators, which allowed for the evaluation of disability at various levels and with varying healthcare needs. However, the study also had limitations. First, the measurements of chronic and communicable conditions were self-reported by the inmates, which did not allow for the accuracy of the diagnoses to be established through confirmatory laboratory tests. This could have led to a non-differential misclassification of the outcome (health conditions), which might have caused an underestimation of effect estimates. Also, it is important to note that the data used in this study were derived from self-reports provided during the Ecuador Prison Census. This self-reporting approach introduces the possibility of the under-reporting or “masking” of disability due to various factors, such as stigma, the fear of discrimination, or perceived vulnerability within the prison environment. Second, self-reporting may lead to recall bias because these conditions (health conditions) were developed prior to prison entry. While measurement errors in the health characteristics may have existed in this study, previous studies have also used self-reported data in prison populations due to the scarcity of available data [17,38,39]. Nonetheless, it is important to address health inequalities and inequities in vulnerable populations [40]. Third, reverse causality was one of the main limitations of this study’s design because of the lack of temporality in the measurement of the variables. Fourth, there could be residual confounding due to not considering important confounding variables, such as the participants’ access to healthcare services. Fifth, the WG-SS specifically asked about permanent difficulties in various functional domains, such as mobility, self-care, communication, hearing, vision, and cognition. As a result, our study did not capture temporary or less permanent disabilities, which may fluctuate over time or resolve completely. Additionally, this is an exploratory study that exposes a public health problem in various regions of the world, which should be addressed in each country’s agenda. Therefore, high quality studies are required to adequately determine the health characteristics of this vulnerable population.

5. Conclusions

In conclusion, people with disabilities and multiple disabilities represent 8% and 2% of the entire prison population in Ecuadorian prisons, respectively. In addition, a higher

proportion of women had disabilities, some difficulty functioning, and multiple disabilities compared to male prisoners, reflecting their greater vulnerability and health inequalities. Furthermore, people with disabilities and multiple disabilities had higher odds of several health conditions compared to their counterparts. Our results underscore the urgent need for targeted health policies and inclusive practices within the prison system to address these disparities. Therefore, governmental and non-governmental institutions are required to prioritize health care and rehabilitation for incarcerated people with disabilities in order to reduce health inequalities and the burden of disease. Future research should focus on longitudinal studies to better understand the temporal dynamics of health conditions in this population and evaluate the effectiveness of specific interventions designed to mitigate health inequalities.

Supplementary Materials: The following supporting information can be downloaded at <https://www.mdpi.com/article/10.3390/disabilities4030040/s1>. Table S1: associations between the different degrees of disability and health conditions in incarcerated individuals.

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