



# BMJ Open What is the NCD service capacity and disruptions due to COVID-19? Results from the WHO non-communicable disease country capacity survey in the Americas region

Silvana Luciani , Roberta Caixeta, Carolina Chavez, Dolores Ondarsuhu , Anselm Hennis

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Department of Noncommunicable Diseases and Mental Health, Pan American Health Organization, Washington, District of Columbia, USA

## Correspondence to

Silvana Luciani;  
lucianis@paho.org

## ABSTRACT

**Objective** This article presents the Americas regional results of the WHO non-communicable diseases (NCDs) Country Capacity Survey from 2019 to 2021, on NCD service capacity and disruptions from the COVID-19 pandemic.

**Setting** Information on public sector primary care services for NCDs, and related technical inputs from 35 countries in the Americas region are provided.

**Participants** All Ministry of Health officials managing a national NCD programme, from a WHO Member State in the Americas region, were included throughout this study. Government health officials from countries that are not WHO Member States were excluded.

**Outcome measures** The availability of evidence-based NCD guidelines, essential NCD medicines and basic technologies in primary care, cardiovascular disease risk stratification, cancer screening and palliative care services were measured in 2019, 2020 and 2021. NCD service interruptions, reassignments of NCD staff during the COVID-19 pandemic and mitigation strategies to reduce disruptions for NCD services were measured in 2020 and 2021.

**Results** More than 50% of countries reported a lack of comprehensive package of NCD guidelines, essential medicines and related service inputs. Extensive disruptions in NCD services resulted from the pandemic, with only 12/35 countries (34%), reporting that outpatient NCD services were functioning normally. Ministry of Health staff were largely redirected to work on the COVID-19 response, either full time or partially, reducing the human resources available for NCD services. Six of 24 countries (25%) reported stock out of essential NCD medicines and/or diagnostics at health facilities which affected service continuity. Mitigation strategies to ensure continuity of care for people with NCDs were deployed in many countries and included triaging patients, telemedicine and teleconsultations, and electronic prescriptions and other novel prescribing practices.

**Conclusions** The findings from this regional survey suggest significant and sustained disruptions, affecting all countries regardless of the country's level of investments in healthcare or NCD burden.

## STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ This is the only region-wide analysis in the Americas, with data from 2019 to 2021, that has systematically measured the non-communicable disease (NCD) service capacity, disruptions of NCD services due to the COVID-19 pandemic, as well as the mitigation strategies used to ensure continuity of services across 35 countries.
- ⇒ It is based on validated government information from a global standardised methodology, applied by the WHO since 2001 to monitor country capacity for NCD policies and services.
- ⇒ The main limitation is that this study did not provide the specificity of information by health centre level of NCD service capacity and disruptions during the COVID-19 pandemic. In addition, it did not provide information on the impact of these disruptions on people's health outcomes.
- ⇒ The methodological limitation of this study is that it uses a self-administered questionnaire, and the process for responding to the questions could have varied across countries, with little space for qualitative data collection that could contribute to better understand the reasons for service disruptions. Also, country names, for comparison purposes, was not possible due to agreements in this global WHO survey with Member States.

## INTRODUCTION

People with non-communicable diseases (NCDs) require timely diagnosis, continuous treatment and access to essential medicines, as well as ongoing monitoring of their conditions to prevent complications and premature death. Yet health systems in most low-income and middle-income countries are not adequately equipped to meet the growing NCD health demands, which has led to global calls for universal health coverage and strengthening primary care services to improve NCD (cardiovascular

diseases, cancer, diabetes, chronic respiratory diseases) prevention and control.<sup>1 2</sup> The WHO has established, and routinely monitors, targets to strengthen the health system response to NCDs that cover NCD guidelines and access to essential medicines and technologies, for the four main NCDs (cardiovascular diseases, cancer, diabetes and chronic respiratory diseases), in addition to NCD risk factor targets.<sup>3</sup> To strengthen NCD services, the focus has been on increasing the use of evidence-based national guidelines/protocols/standards for the management of the four main NCDs through a primary care approach in the public sector; as well as provision of drug therapy, including glycaemic control, and counselling for eligible persons at high risk to prevent heart attacks and strokes, with emphasis on the primary care level. These interventions are based on a cost effectiveness analysis, that, together with risk factor reduction interventions, are expected to reduce premature NCD mortality.<sup>4</sup>

In the Americas region, where an estimated 240 million people are living with a chronic condition<sup>5</sup> health systems strengthening for NCDs has been a focus for the Pan American Health Organization (PAHO) Member States since the adoption of a regional NCD plan of action by the Ministries of Health in 2013.<sup>6</sup> Progress has been gradual and an assessment of the NCD plan of action, in 2020, noted that 17/35 countries (48.5%) had implemented a model of integrated management for NCDs, such as a chronic care model with evidence based guidelines, a clinical information system, self-care, community support and multidisciplinary team-based care.<sup>7</sup> However, the COVID-19 pandemic subsequently has had a significant adverse impact on the Region, including a marked disruption of NCD services.

COVID-19 has been diagnosed in over 153 million people and led to more than 2.7 million deaths in the Region of the Americas, by the end of April 2022.<sup>8</sup> The importance of NCDs as factors leading to severe COVID-19 related illness or death is now well documented, highlighting the importance of optimal NCD management.<sup>9 10</sup> However, the pandemic has negatively impacted NCD management, related to the extensive primary care disruptions. Two years into the pandemic, 93% (25/27 countries) of countries in the Americas have reported disruptions in their essential primary care health services along the 66 tracer services in health systems (eg, cancer screening, diabetes management, hypertension management).<sup>11</sup>

So to what extent have these health system disruptions affected NCD services? This article presents information to respond to the research question on what is the NCD service capacity and disruptions due to the COVID-19 pandemic, from the perspective of the health authorities responsible for the national NCD programmes and services across the Region of the Americas.

## METHODS

This is a descriptive study, in which information on NCD services and disruptions resulting from the COVID-19

pandemic was extracted from the WHO dataset on the NCD Country Capacity Surveys (CCS) 2019–2021, from the 35 Member States of the PAHO. These are a diverse range of countries and to provide context to help situate the findings, the list of countries and selected characteristics are provided in online supplemental appendix 1. The CCS is a closed, non-randomised, web-based survey using a standardised global methodology that collects information on, among other topics, NCD services (module 4), and on NCD service disruptions (module 5). An NCD service was described as healthcare encompassing front-line health service delivery (primary care) or higher-level services for any of the main NCDs. All statistical analyses were carried out using STATA V.17 software (Stata, 2017). P values are not presented due to the descriptive characteristics of the study.

Responses to the CCS were provided by the official Ministry of Health authorities responsible for the national NCD programme, and submitted directly, using their unique access to the WHO CCS on-line tool. Data were then validated by PAHO/WHO, and in the event of any discrepancies or unanswered questions, feedback was sought from the designated Ministry of Health official.

The CCS was administered in March to June 2019; and from May to June 2020 module 5 was administered, with a response rate of 83% (29/35 countries). In 2021, the CCS was administered again from May to September 2021, with a 100% (35/35 countries) response rate.

Results presented are from all 35 countries from CCS 2021, and they are presented as a regional evaluation showing number and proportion of countries, without identifying countries, due to confidentiality agreements. A comparison of the impact of COVID-19 on NCD services in both years are presented, in which case data from the same 29 countries that responded to module 5 in both rounds (2020 and 2021) are presented.

## Patient and public involvement

There is no patient involvement in this analysis.

## RESULTS

### Overall limited NCD service capacity in primary care

For NCD service capacity, the CCS assesses the availability of evidence-based guidelines, essential medicines and technologies in primary care, cardiovascular disease risk stratification in clinical practice, and cancer screening and palliative care. Overall, NCD service capacity is rather limited in the Americas. Evidence-based national guidelines/protocols/standards for the four principal NCDs are available in only 63% (22/35) of countries, a slight improvement from 54% (19/35) in 2019. The most frequently available guidelines used in at least 50% of public healthcare facilities were on diabetes (74%), hypertension (69%), cancer (60%) and chronic respiratory diseases (51%) (online supplemental appendix 2). Only 29% of countries (10/35) offered cardiovascular risk stratification in clinical practice for the management

of patients at high risk for heart attack and stroke in half or more of the primary healthcare facilities in the public sector.

Essential technologies for cardiovascular diseases (blood pressure measurement devices, total cholesterol measurement and urine strips for albumin assay) are available in at least half of the healthcare facilities of the public health sector in 51% (18/35) of countries; and only 34% (12/35) of countries reported having all technologies available for diabetes (blood glucose measurement, oral glucose test, hemoglobin A1c (HbA1c) test, dilated fundus examination, foot vibration perception by tuning fork and urine strips for glucose and ketone measurement). This situation has not changed since 2019 (table 1).

Essential medicines for cardiovascular diseases (aspirin, thiazide diuretics, ACE inhibitors, angiotensin II receptor blockers (ARBs) calcium channel blockers, beta blockers and statins) were generally available in pharmacies in all almost all countries, with the exception of ARBs which are available in only 74% of countries (26/35). For diabetes, the essential medicines (insulin, metformin, sulphonylureas) are reported as being generally available in almost all countries and this situation has not changed since 2019. Regarding chronic respiratory diseases, steroid inhalers and bronchodilators are available in 77% (27/35) and 89% (31/35) of countries, respectively. Nicotine replacement therapy for smoking cessation remains very limited in the region, with only 23% (8/35) of countries reporting availability. Oral morphine was also identified as an essential medicine which was not widely available in pharmacies, with around half of the countries (51%, 18/35 countries) reporting its availability (table 1).

Cancer screening is offered in primary care in many countries in the Americas, with 63% (22/35 countries) reporting breast cancer screening; 83% (29/35) reporting cervical cancer screening and 43% (15/35) of countries reporting colorectal cancer screening. Overall, only 43% of the countries (15/35) reported having a screening programme for all three cancer types, and this situation had improved somewhat since 2019. Palliative care services to provide supportive and end-of-life care for people with cancer and other chronic conditions are offered in primary healthcare facilities in only 37% of countries (13/35) or community and home-based care in 46% of countries (16/35) and is yet another NCD service that requires strengthening.

### NCD service disruptions due to the COVID-19 pandemic

NCD services were identified as part of the government's core set of essential health services to be maintained during the pandemic in 21 of 26 countries (81%). Nine countries (26%) reported allocating additional funding to NCDs in the government budget for the COVID-19 response (table 2). Despite this, only 12/35 countries (34%) reported that outpatient NCD services were functioning normally and only 11% of countries (4/35) reported that no activities for NCDs had been postponed

**Table 1** Proportion of countries (%) with available basic NCD technologies and essential medicines in primary care facilities of the public health sector, Americas Region 2019–2021

	Countries (%)	
	2019	2021
All basic NCD technologies*	5	4
Measuring weight	100	97
Measuring height	100	100
Blood glucose measurement	94	94
Oral glucose tolerance test	63	69
HbA1c test	51	54
Dilated fundus examination	37	51
Foot vibration perception by tuning fork	43	51
Urine strips for glucose and ketone measurement	63	57
Blood pressure measurement	97	94
Total cholesterol measurement	77	71
Urine strips for albumin assay	60	54
Peak flow measurement spirometry	31	17
All essential NCD medicines†	17	20
Insulin	83	91
Aspirin (75/100 mg)	94	91
Metformin	94	100
Thiazide diuretics	91	89
ACE inhibitors	91	89
Angiotensin II receptor blockers	77	74
Calcium channel blockers	89	89
Beta blockers	86	91
Statins	83	86
Oral morphine	49	51
Steroid inhaler	77	77
Bronchodilator	91	89
Sulphonylurea(s)	91	97
Benzathine penicillin injection	89	89
Nicotin Replacement Therapy	23	23

Range distribution of countries (%). <25, 25–49, 50–74, 75–99, 100. WHO NCD Country Capacity Survey, 2019–2021.  
 \*Available in 50 or more of the public healthcare facilities.  
 †Available in 50 or more pharmacies.  
 NCD, non-communicable disease.

due to the pandemic (figure 1). In 2021, three more countries reported that NCD outpatient services were functioning normally compared with 2020; while three fewer countries reported that NCD inpatient services were functioning normally (online supplemental appendix 3).

Ministry of Health staff designated to work on NCD services were largely redirected to work on the COVID-19 response, either full time or part time, reducing the human resources available to provide care for people with

**Table 2** NCD service disruptions during the COVID-19 pandemic, Americas Region, 2020–2021

	Countries (%)		Comparison of countries (%) in 2020 and in 2021	
	2021 (n=35 countries)	2020 (n=29 countries)	2021 (n=29 countries)	
Redirected NCD resources				
Staff reassigned/deployed to COVID-19 response				
Some staff partially reassigned	40 (14/35)	38 (11/29)	48 (14/29)	
Some staff fully reassigned	26 (9/35)	21 (6/29)	31 (9/29)	
All staff partially reassigned	20 (7/35)	31 (9/29)	28 (8/29)	
All staff fully reassigned	6 (2/35)	7 (2/29)	7 (2/29)	
No staff reassigned	6 (2/35)	3 (1/29)	7 (2/29)	
Don't know	3 (1/35)	0 (0/29)	3 (1/29)	
Government NCD funds allocated to support COVID-19 response				
None or not yet	29 (10/35)	59 (17/29)	31 (9/29)	
Don't know	49 (17/35)	34 (10/29)	48 (14/29)	
1%–25%	14 (5/35)	0 (0/29)	10 (3/29)	
26%–50%	3 (1/35)	0 (0/29)	3 (1/29)	
51%–75%	6 (2/35)	3 (1/29)	7 (2/29)	
76%–100%	0 (0/35)	3 (1/29)	0 (0/29)	
NCD services included in COVID-19 response				
NCD services included as part of the list of essential health services in the COVID-19 plan				
Cardiovascular disease services	95 (20/21)	N/A	N/A	
Cancer services	86 (18/21)	N/A	N/A	
Diabetes services	100 (21/21)	N/A	N/A	
Chronic respiratory disease services	86 (12/21)	N/A	N/A	
Chronic kidney disease and dialysis services	0 (0/35)	N/A	N/A	
Tobacco cessation services	48 (10/21)	N/A	N/A	
Other	14 (3/21)	N/A	N/A	
Additional funding allocated for NCDs	26 (9/35)	10 (3/29)	10 (3/29)	
NCD activities postponed due to COVID-19 pandemic				
None	11 (4/35)	17 (5/29)	10 (3/29)	
Implementation of NCD surveys	40 (14/35)	55 (16/29)	45 (13/29)	
Public screening programmes for NCDs	51 (18/35)	45 (13/29)	48 (14/29)	
WHO PEN package implementation*	23 (8/35)	21 (6/29)	24 (7/29)	
WHO HEARTS package† implementation	29 (10/35)	31 (9/29)	31 (9/29)	
Mass communication campaigns	34 (12/35)	24 (7/29)	34 (10/29)	
Other	11 (4/35)	24 (7/29)	10 (3/29)	

WHO NCD Country Capacity Survey, 2019–2021. Round 1 (R1) conducted in 2020 and Round 2 (R2) conducted in 2021. Data for comparison not available between 2020 and 2021.

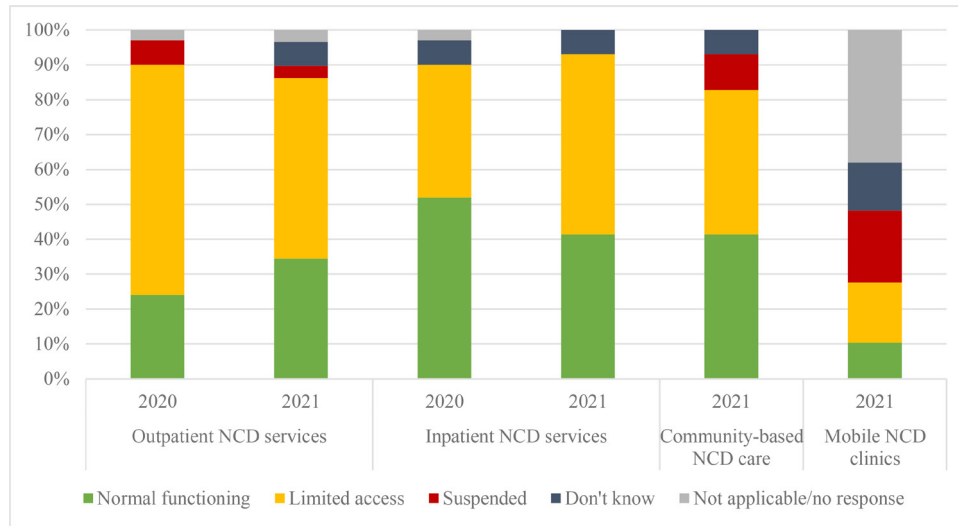
\*WHO PEN package is a set of essential primary care interventions for the main NCDs, and can be found here: <https://www.who.int/publications/i/item/9789240009226>.

†WHO Hearts package is the primary care interventions to improve hypertension diagnosis, treatment and control and can be found here: <https://www.who.int/publications/i/item/9789240001367>.

N/A, not applicable; NCD, non-communicable disease.

NCDs. Only 2 countries (6%, 2/35 countries) reported that no NCD staff had been redirected to support the COVID-19 effort. By 2021 this situation had worsened, with 14 countries reporting NCD staff were reassigned to the pandemic, up from 11 countries in 2020 (table 2).

Regarding service disruptions, outpatient NCD services were suspended in one country, community NCD services were suspended in four countries and mobile NCD clinics were suspended in six countries. The majority of countries reported limited access to outpatient services (19/35

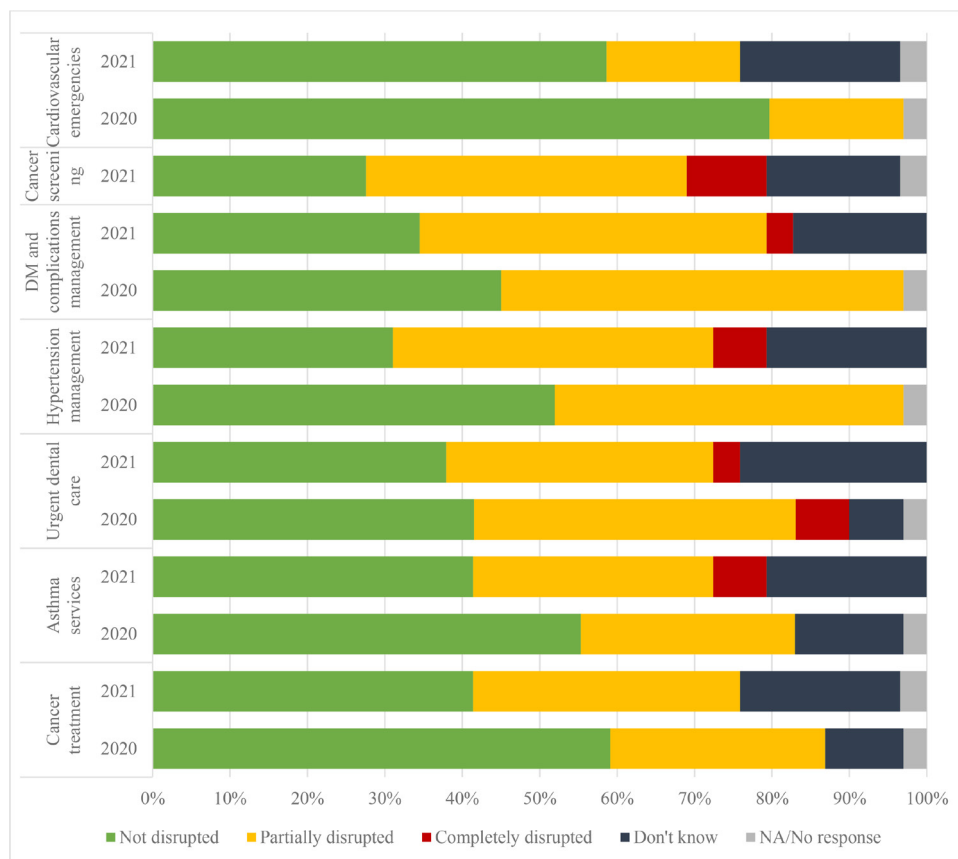


**Figure 1** Proportion of countries (%) with disruptions in NCD services during the COVID-19 pandemic, Americas region, 2020–2021. NCD, non-communicable disease.

countries, 54%), and to inpatient NCD services (19/35 countries, 54%) (figure 1).

The disruption in NCD services, either partially or completely, affected all types of care for people with NCDs, but more so for diabetes and hypertension services (figure 2 and online supplemental appendix 4). The

main reasons cited for disruption of NCD services related to human resources, where 17 countries (74%, 17/24 countries) reported it was due to NCD staff deployed to the COVID response, or simply insufficient clinical staff to provide the service (46%, 11/24 countries). Two countries (8%, 2/24 countries) noted clinical staff did not have



**Figure 2** Proportion of countries (%) with NCD Service Disruptions by Service Type due to the COVID-19 pandemic, Americas Region, 2020–2021. Country does not provide the service. Cancer screening was not included in the 2020 survey. Cardiovascular emergencies include myocardial infarctions, stroke and cardiac arrhythmias. DM, diabetes mellitus; N/A, not applicable; NCD, non-communicable disease.

personal protective equipment which affected service provision. Six countries (25%, 6/24 countries) reported stock out of essential NCD medicines and or diagnostics at the health facility level which affected service continuity. Inpatient NCD services were mainly disrupted due to the cancellation of elective procedures (63%, 15/24 countries), and hospital beds or inpatient service were simply not available in 46% of countries (11/24 countries). The extent of disruptions for NCD services worsened in 2021, as compared with the situation in 2020 for all types of NCD services (figure 2).

Beyond service disruption, planned NCD activities have been suspended or postponed due to the COVID-19 pandemic, and only small improvements over time were observed (table 2). The activities most commonly reported as suspended were screening people for cancer, diabetes and other NCDs in 51% of the countries (18/35 countries), the implementation of NCD surveys, where 14 countries (40%) report postponing surveys and the implementation of the Hearts technical package was suspended or postponed in 10 countries.

Perhaps the more influential driver of NCD service disruptions, however, is on the demand side, where COVID-19 lock down measures and fear or mistrust with community transmission led to many people not seeking care or patients not presenting for care, as reported in 18 countries and 17 countries, respectively (75%, 18/24 countries; 71% 17/24 countries). Financial difficulties (46% 11/24 countries) and travel restrictions hindering people's access to health facilities (50%, 12/24 countries) were also cited as important causes of disrupted NCD services.

### Strategies and plans to mitigate NCD service disruptions

Many different approaches were employed to minimise the disruption in NCD services during the pandemic which did not change over 2020–2021: home-based care, triage patients and prioritise care based on severity of

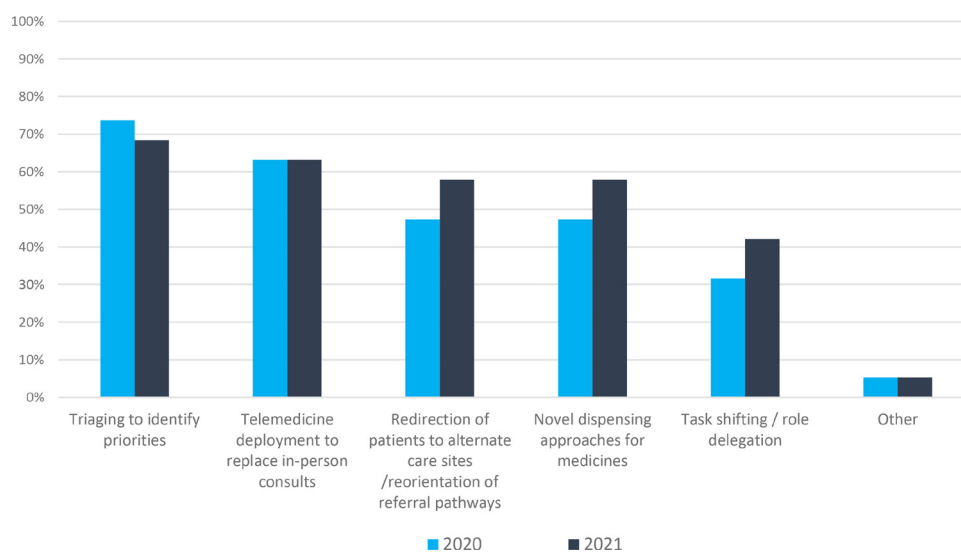
condition, and support for self-care were most commonly reported (figure 3). Telemedicine was employed to replace in person consultations (16/24 countries, 67%) and this was sustained over time (online supplemental appendix 5).

When prompted on plans to reinstate disrupted NCD services, most respondents indicated that the priority was to train healthcare professionals in NCD diagnosis and treatment, reinstate cancer screening services, continue use of recurring medicine prescription and continue the use of telemedicine.

Respondents also identified their immediate needs to assist with building stronger health services for NCDs. The main needs identified were guidelines for NCD and COVID-19 clinical management; guidance on promoting healthy lifestyles especially post-COVID-19 to motivate behaviour change; extension of telemedicine services to facilitate continuous communication with patients especially those living in remote areas or large distances from health facilities; systems for tracking patients with NCDs including Apps that can better support self-management; and rehabilitation services for those people suffering long-term symptoms from COVID-19 including respiratory symptoms.

## DISCUSSION

This is the only region-wide survey in the Americas, that has systematically measured the NCD service capacity, the disruption of NCD services due to the COVID-19 pandemic, as well as the mitigation strategies used to ensure continuity of services. More than half of the countries in the region do not have the comprehensive package of guidelines, technologies and medicines for all four major NCDs and there was little reported change between 2019 and 2021 on the NCD service capacity. Nonetheless, the Americas region has been noted to



**Figure 3** Proportion of countries (%) with approaches employed to overcome NCD service disruptions due to COVID-19 Pandemic, Americas Region, 2020–2021. NCD, non-communicable disease.

have among the higher levels of NCD service capacity as compared with the other World regions<sup>12</sup>; and a much greater NCD service capacity than as reported in a similar survey conducted in primary care centres in India.<sup>13</sup>

The findings from this regional survey suggest significant and sustained disruptions, affecting all countries regardless of the country's level of investments in health-care or NCD burden. This situation appears to be consistent with the situation reported in other regions of the world.<sup>12 14–16</sup>

To assist governments in maintaining essential NCD services at this time, PAHO/WHO has published guidelines to assist with triaging patients, use telemedicine and multimonth prescriptions more broadly, and reorganise oncology services.<sup>17</sup> The extent of use or application of these guidelines is not known, although the results of this survey indicate that many national NCD programme managers had use for the guidance on maintaining essential NCD services.

More research is needed to document the extent, and consequences of NCD service disruption in the Americas region. Further research is also needed to better understand how effective the mitigation strategies of triaging patients, e-prescriptions and telemedicine, were as substitution for face-to-face encounters; and whether inequities in access to primary NCD services were further exacerbated by the NCD service disruptions.

Some of this research has begun in the region. For example, a survey of NCD patient advocacy organisations in Latin America, noted the dissatisfaction and poorer quality of care during 2020–2021, where 52% of respondents experienced delays of 30 days or more for primary care; telemedicine was reported as not accessible to patients by 37% of respondents and a majority (76%) of NCD patients faced challenges with refilling prescription medication.<sup>18</sup> In Mexico, the social security system, IMSS, noted reduced screening for breast and cervical cancer (–79% and –68%), diabetes and hypertension care (–32% in both), attributed to underfunding, shortages in human resources and reallocation of health staff and infrastructure due to COVID-19.<sup>19</sup>

Similarly in the USA, cancer screening declined sharply in 2020 compared with 2019, (breast, –90.8%; colorectal, –79.3%; prostate, –63.4%) and breast cancer diagnosis has been observed to decrease during the pandemic.<sup>20 21</sup> The USA has also been noted to have the highest absolute number of excess deaths in 2020 (458 000) as compared with 29 other countries.<sup>22</sup> A large excess death rate of 64% more deaths in 2020 than 2019 were also reported in Ecuador, where it was found that indigenous populations had four times the excess death rate of the majority mestizo group, indicating unequal impact of COVID on vulnerable populations.<sup>23</sup>

Brazil has also reported significant declines in utilisation of primary care services by people with NCDs,<sup>24</sup> and in one state almost a third of people living with NCDs reported impaired management of their NCD as a result of the COVID-19 restrictions.<sup>25</sup> Brazil has also noted excess

deaths from cancer and cardiovascular diseases related to the COVID-19 pandemic.<sup>26</sup> The full extent of foregone care, however, is yet to be observed, and more research is needed throughout countries in the Americas region, to determine the impact of NCD service disruptions on diagnosis, treatment and health outcomes for people with NCDs. For example, in the USA, cancer mortality is expected to increase due to reduced screening and early diagnosis,<sup>20</sup> and in the UK, a substantial increase in cancer deaths and morbidity have been predicted due to COVID-19 restrictions.<sup>27–29</sup>

Improving NCD service capacity and NCD management is tied closely to universal health coverage and primary care strengthening. As a way forward, the Americas region has charted a path for creating more resilient health services, which includes strengthening primary care and increasing financial investments in health systems.<sup>30</sup> And as COVID-19 cases continue to decline and health services resume to capacity, the public health priority now needs to be on improving the equitable access to NCD diagnosis and treatment in primary care, which includes updating NCD guidelines, training multidisciplinary healthcare teams, increasing access to essential NCD medicines and technologies, improving self-management support, among others.<sup>31</sup> With regard to NCD medicines and technologies, governments in the Americas region can use the PAHO Strategic Fund which offers a useful mechanism for pooled procurement of quality assured essential NCD medicines and technologies, and was successfully deployed in government responses to COVID-19, and other health priorities.<sup>32</sup>

## CONCLUSIONS

This analysis documents the limitations in NCD service capacity in the Americas region, and the degree of disruptions in access to essential NCD services and medicines. While there are limited published data on the impact that these service disruptions will have on health outcomes, given the significant number of people with NCDs in the Americas, the limited NCD service capacity and extensive disruptions in NCD services from the COVID-19 pandemic, the priority must now be strengthening primary care services for NCDs and addressing the backlog and foregone care for NCD management.

**Contributors** SL and RC conceived the original idea. RC, CC and DO collected and analysed the data. SL, RC, CC, DO and AH interpreted the results. SL wrote the paper, RC, CC, DO and AH reviewed and contributed to the paper. SL, RC, CC, DO and AH approved the final version. SL acted as guarantor.

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available in the WHO Global Health Observatory. Data from the Americas region are available on reasonable request (deidentified data by country) from PAHO/WHO per request at: nmhsurveillance@paho.org.

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#### ORCID iDs

Silvana Luciani <http://orcid.org/0000-0002-3122-1258>

Dolores Ondarsuhu <http://orcid.org/0000-0003-0506-3046>

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**Appendix 1.** Countries of the Americas region included in the analysis

Country	Population (thousands)	Public health expenditure as % of GDP	NCD Mortality Rate (age-adjusted per 100 000 pop)
<b>Northern America</b>			
Canada	38,067.90	7.9	302
United States of America	332,915.10	8.5	408
<b>Mexico, Central America, and Latin Caribbean</b>			
Belize	404.9	3.9	452
Costa Rica	5,139.10	5.5	310
Cuba	11,317.50	9.9	431
Dominican Republic	10,953.70	2.5	508
El Salvador	6,518.50	4.5	393
Guatemala	18,249.90	2.1	498
Honduras	10,063.00	2.8	615
Mexico	130,262.20	2.7	466
Nicaragua	6,702.40	5.1	548
Panama	4,381.60	4.6	335
<b>South America</b>			
Argentina	45,605.80	5.9	436
Bolivia	11,832.90	4.5	584
Brazil	213,993.40	4	425
Chile	19,212.40	4.6	329
Colombia	51,265.80	5.5	327
Ecuador	17,888.50	4.2	365
Peru	33,359.40	3.3	304
Paraguay	7,219.60	2.9	448
Uruguay	3,485.20	6.7	446
Venezuela	28,704.90	1.7	412
<b>Non-Latin Caribbean</b>			
Antigua and Barbuda	98.70	2.9	502
Bahamas	396.90	3.1	533
Barbados	287.70	2.9	477
Dominica	74.30	4.3	.
Grenada	113.00	1.7	619
Guyana	790.30	3.7	802
Haiti	11,541.70	0.9	839
Jamaica	2,973.50	3.9	455
Saint Kitts and Nevis	54.20	2.5	.
Saint Lucia	184.40	2.1	516
Saint Vincent and the Grenadines	111.30	3.1	537
Suriname	591.80	5.3	666
Trinidad and Tobago	1,403.40	3.4	439

Source: PAHO Core Indicators, 2022

**Appendix 2:** Availability of guidelines/protocols for the management of NCDs, referred by national NCD programs. Region of the Americas, 20019-2021

NCD guidelines/protocols	Hypertension		Diabetes		Cancer		Chronic respiratory		NCD4 Guidelines/protocols	
	2019	2021	2019	2021	2019	2021	2019	2021	2019	2021
Availability	86%	89%	97%	97%	77%	89%	66%	71%	54%	63%
Utilized in at least 50% of health care facilities	73%	69%	74%	74%	70%	60%	74%	51%	34%	40%
Last time updated										
last 5 years	23%	46%	46%	63%	26%	31%	14%	17%	.	.
6 to 10 years	40%	26%	23%	11%	34%	29%	23%	23%	.	.
>10 years	20%	11%	23%	14%	14%	23%	20%	26%	.	.
Includes referral criteria	77%	77%	82%	89%	85%	80%	78%	60%	37%	49%

Source: WHO NCD Country Capacity Survey, 2019-2021.

**Appendix 3.** Access to NCD services during the COVID-19 pandemic. Americas region, 2020-2021

NCD services	Countries R2 (%)	Same countries R1 and R2 (%)	
	2021 (n=35 countries)	2020 (n=29 countries)	2021 (n=29 countries)
Outpatient NCD services			
Functioning as normal	34% (12/35)	24% (7/29)	34% (10/29)
Limited access	54% (19/35)	66% (19/29)	52% (15/29)
Suspended	3% (1/35)	7% (2/29)	3% (1/29)
Don't know	6% (2/35)	0% (2/29)	7% (2/29)
Not applicable/No response	3% (1/35)	3% (1/29)	3% (1/29)
Inpatient NCD services			
Functioning as normal	40% (14/35)	52% (15/29)	41% (12/29)
Limited access	54% (19/35)	38% (11/29)	52% (15/29)
Suspended	0% (2/35)	0% (0/29)	0% (0/29)
Don't know	6% (2/35)	7% (2/29)	7% (2/29)
Not applicable/No response	0% (2/35)	3% (1/29)	0% (2/29)
Community-based NCD care			
Functioning as normal	37% (13/35)	N/A	41% (12/29)
Limited access	43% (15/35)	N/A	41% (12/29)
Suspended	11% (4/35)	N/A	10% (3/29)
Don't know	6% (2/35)	N/A	7% (2/29)
Not applicable/No response	3% (1/35)	N/A	0% (2/29)
Mobile NCD clinics			
Functioning as normal	11% (4/35)	N/A	10% (3/29)
Limited access	23% (8/35)	N/A	17% (5/29)
Suspended	17% (6/35)	N/A	21% (6/29)
Don't know	14% (5/35)	N/A	14% (4/29)
Not applicable/No response	34% (12/35)	N/A	38% (11/29)

Source: WHO NCD Country Capacity Survey, 2019-2021

Note: Round 1 (R1) conducted in 2020 and Round 2 (R2) conducted in 2021.

N/A – not applicable, data for comparison not available between 2020 and 2021.

**Appendix 4.** NCD service disruption due to COVID-19. Region of the Americas, 2021 results.

Disruption level	Hypertension management		Cardio-vascular emergencies		Cancer screening		Cancer treatment		Diabetes and complications		Asthma		Urgent dental care		Rehabilitation		Palliative care	
	2020	2021	2020	2021	2020	2021	2020	2021	2020	2021	2020	2021	2020	2021	2020	2021	2020	2021
Not disrupted	52% (15/29)	31% (9/29)	79% (23/29)	59% (17/29)	N/A	28% (8/29)	59% (17/29)	41% (12/29)	45% (13/29)	34% (10/29)	55% (16/29)	41% (12/29)	41% (12/29)	38% (11/29)	14% (4/29)	N/A	24% (7/29)	N/A
Partially disrupted	45% (13/29)	41% (12/29)	17% (5/29)	17% (5/29)	N/A	41% (12/29)	28% (8/29)	34% (10/29)	52% (15/29)	45% (13/29)	28% (8/29)	31% (9/29)	41% (12/29)	34% (10/29)	38% (11/29)	N/A	34% (10/29)	N/A
Completely disrupted	0% (0/29)	7% (2/29)	0% (0/29)	0% (0/29)	N/A	10% (3/29)	0% (0/29)	0% (0/29)	0% (0/29)	3% (1/29)	0% (0/29)	7% (2/29)	7% (2/29)	3% (1/29)	21% (6/29)	N/A	7% (2/29)	N/A
Don't know	0% (0/29)	21% (6/29)	0% (0/29)	21% (6/29)	N/A	17% (5/29)	10% (3/29)	21% (6/29)	0% (0/29)	17% (5/29)	14% (4/29)	21% (6/29)	7% (2/29)	24% (7/29)	24% (7/29)	N/A	31% (9/29)	N/A
NA/NR	3% (1/29)	0% (0/29)	3% (1/29)	3% (1/29)	N/A	3% (1/29)	3% (1/29)	3% (1/29)	3% (1/29)	0% (0/29)	3% (1/29)	0% (0/29)	3% (1/29)	0% (0/29)	3% (1/29)	N/A	3% (1/29)	N/A

Source: WHO NCD Country Capacity Survey, 2019-2021

N/A – not applicable, data for comparison not available between 2020 and 2021.

NR – no response

**Appendix 5.** Approaches employed to overcome NCD service disruptions due to COVID-19 Pandemic. Americas Region, 2020-2021.

Approaches to overcome NCD service disruption	Countries R2 (%)	Same countries R1 and R2 (%)	
	2021 (n=35 countries)	2020 (n=29 countries)	2021 (n=29 countries)
Triaging to identify priorities	75% (18/24)	74% (14/19)	68% (13/19)
Telemedicine deployment to replace in-person consults	67% (16/24)	63% (12/19)	63% (12/19)
Redirection of patients to alternate care sites /reorientation of referral pathways	67% (16/24)	47% (9/19)	58% (11/19)
Novel dispensing approaches for medicines	63% (15/24)	47% (9/19)	58% (11/19)
Task shifting / role delegation	38% (9/24)	32% (6/19)	42% (8/19)
Other	8% (2/24)	5% (1/19)	5% (1/19)
Integration of several services into single visit	38% (9/24)	N/A	N/A
Self-care interventions where appropriate	75% (18/24)	N/A	N/A
Provision of home-based care where appropriate	75% (18/24)	N/A	N/A
Catch-up campaigns for missed appointments	25% (6/24)	N/A	N/A
Recruitment of additional staff	67% (16/24)	N/A	N/A
Expanding facility hours	29% (7/24)	N/A	N/A
Novel supply chain management and logistics approaches	33% (8/24)	N/A	N/A
Novel prescribing approaches (e.g. tele-prescription, extended drug prescriptions)	63% (15/24)	N/A	N/A
Community communications	75% (18/24)	N/A	N/A
Government removal of user fees	0% (0/24)	N/A	N/A

Source: WHO NCD Country Capacity Survey, 2019-2021

N/A – not applicable, data for comparison not available between 2020 and 2021.

NR – no response.