Lessons on integrated chronic care organisation of primary care during the COVID-19 pandemic: case study analyses in Cambodia, Slovenia, and Belgium

Katrien Danhieux (katrien.danhieux@uantwerpen.be)
University of Antwerp
Monika Martens
Institute of Tropical Medicine Antwerp
Srean Chhim
National Institute of Public Health
Matic Mihevc
Community Health Centre Ljubljana
Sokunthea Yem
National Institute of Public Health
Antonija Poplas Susič
Community Health Centre Ljubljana
Wim Van Damme
Institute of Tropical Medicine Antwerp
Caroline Masquillier
University of Antwerp
Edwin Wouters
University of Antwerp
Josefien van Olmen
University of Antwerp

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Abstract

Background

During the COVID-19 pandemic, people living with Noncommunicable diseases (NCDs) were at double risk: developing severe COVID-19 and developing complications from not having their chronic condition(s) well controlled. Primary Health Care (PHC) is paramount for integrated care of chronic diseases, but was severely restrained during the pandemic. Our aim was to examine how the organisation of PHC for chronic diseases was affected by the pandemic, and as such, shine a light on strengths, weaknesses, and opportunities in different types of health systems.

Methods

Semi-structured interviews with 69 participants were carried out in three countries with different primary health care systems: a developing health system in a lower middle-income country (Cambodia); a centrally steered health system in a high-income country (Slovenia); and a publicly funded highly privatised health-care health system in a high-income country (Belgium). Both PHC providers and macro-level stakeholders were interviewed by the international team. An inductive thematic analysis was performed.

Results

In all three countries the workload of the staff was high and shifted towards pandemic related tasks, affecting availability for chronic care. It also created space for innovations such as telemedicine. In general, recognition of the importance of PHC increased. But also considerable differences between the three countries' health care systems have been uncovered. In Cambodia medicines are lacking but a strong civil servant ethos is present. In Slovenia strong leadership appeared to be an important strength, but flexibility of PHC workers was limited. This flexibility and entrepreneurship turned out to be valuable in Belgium, but there fragmentation of PHC was a barrier.

Conclusions

Moments of crisis and disruption lay bare the structural agility and gaps more clearly, as a magnifying glass. In Cambodia, there is a need to sustainable supply of medicines. In Slovenia, the shortage of general practitioners (GPs) needs attention. In Belgium, rethinking of the PHC practice organisation is needed. Our analyses provide the opportunity to analyze and build back stronger health care systems.

Background

The COVID-19 pandemic has had a tremendous impact on people's lives around the world (1). A particularly vulnerable group are persons with Non-Communicable Diseases (NCDs), as 60–90% of the more than six million global COVID-19 deaths had at least one underlying NCD (2). People with NCDs which are often chronic require integrated care, meaning coordination and continuity of health care services (3, 4). During the COVID-19 pandemic, people living with NCDs were therefore at double risk; firstly, they were at increased risk for developing severe and even fatal COVID-19 because of their underlying condition, and secondly, since their chronic care provision was impeded, they were at risk of developing acute and long term complications. (2, 4–7).

Within the health system, Primary Health Care (PHC) is paramount for disease management and control as the first point of access to care for patients, and the level of care on which follow-up for the majority of the patients is organised (3), both for acute and chronic conditions such as NCDs. Also in the pandemic crisis context, primary care services took up a vital role as the first point of contact for possibly infected patients (8–11). Hence, PHC systems were strongly challenged and put under pressure to co-organise appropriate response to many new COVID-19 patients, while assuring that their other tasks were maintained in this crisis context (3, 4).

The response and resilience of the primary health care system to the COVID-19 pandemic varied across countries and time (12–14). It is an open question whether health system responses have exacerbated existing vulnerabilities or opened up new opportunities for strengthening socially-just health systems (15). More understanding of the experiences of health system stakeholders (decision-makers, health care managers, workers with NCDs, etc.) in a variety of contexts, where the epidemic was spreading at different speeds and with different socio-economic and health impacts, is therefore, needed (1). The aim of this study was to examine how the organisation of primary care for chronic diseases was affected by the COVID-19 crisis, and through this analysis identify the strengths, weaknesses, and opportunities of the primary health care in different health systems contexts. Our four research questions are:

1. What was the direct impact of the COVID-19 pandemic on patients with chronic disease?

2. What strengths of the primary care system did emerge in the crisis context of COVID-19?

3. What weaknesses of the primary care system did emerge in the crisis context of COVID-19?

4. What opportunities of the primary care system did emerge in the crisis context of COVID-19?

Methods

Study setting

This study is part of the process evaluation (16) of the 'SCale-Up integrated care for diaBetes and hYpertension' (SCUBY) project (2019–2023), which aims to provide evidence for the scale-up of

integrated care for type 2 diabetes (T2D) and hypertension in dissimilar types of health systems: Cambodia, Slovenia and Belgium (17). Text box 1 summarises the characteristics of each health system.

Text box 1: Characteristics of health systems in Cambodia, Slovenia, and Belgium

Cambodia is a lower-middle-income country and has a public health system with strong support from the government and donor organisations and a rapidly-growing private sector (18). Cambodia is currently undergoing an epidemiological transition with emerging prominence of NCDs. The Ministry of Health is committed to scale-up care for chronic diseases through the World Health Organization (WHO) Package of Essential Noncommunicable Disease Interventions (PEN) in each operational health district (OD) (19). There are variations in the current delivery of chronic care; PEN has not been implemented nationwide, and in some ODs, a community-based patient support programme (MoPoTsyo) is in place. Overall public health care usage for NCDs is relatively low, people prefer visiting private services for NCD care (20).

Slovenia is a high-income country with a health system that is to a large extent financed by the national health insurance and has mixed public-private providers. Since 2011, the government has invested in the scale-up of upgrading family care practices for chronic diseases management and introduced a new working model. A registered nurse was added to the team consisting of a family physician and a community nurse (21). Protocols for management of patients with T2D, hypertension, and other chronic diseases were implemented and monitored through quality indicators. This has standardised diagnosis, treatment, health education, and referral for patients. Registered nurses were deployed to proactively reach out to and manage patients with stable chronic conditions, health promotion centres provide education, and community nurses reach out to vulnerable patients.

Belgium is a high-income country and has a privatised health-care system, funded through a mix of direct government payment and refunding of patients through third-party payers called sickness funds. Subscription to one of these sickness funds is compulsory and therefore 99% of the population is covered for health services. Health-care providers and patients enjoy a high degree of autonomy of choice. Many patients suffer from multimorbidity, severely affecting their quality of life (22). Since 2009, the government has restructured chronic care for diabetes patients, differentiating roles for primary and secondary care and for self-management support, through care pathways. Multiple projects have been developed to better-reach vulnerable groups and to reduce fragmentation in the system through local health care networks. The success of these policies is, however, limited (23). Most PHC practices in Belgium are monodisciplinary (only physicians), some also include paramedics such as dieticians or nurses. The greatest share of practices is paid on a fee-for-service basis, while some practices choose to work capitation-based; both systems coexist and are mostly publicly financed.

Table 1 shows each country's key characteristic data and NCD epidemiology. Figure 1 portrays the weekly confirmed (a) COVID-19 cases per million people (for each of the three countries), (b) COVID-19 deaths per million people (for each of the three countries) (24), and (c) the COVID-19 Containment and Health Index (for each of the three countries), which is a composite measure based on thirteen policy-response indicators such as school closures, workplace closures, travel bans, testing policy, contact tracing, face coverings, and vaccine policy (25) and is linked to the impact on society of these measurements.

Table 1. COVID-19 and NCD burden (2020, 2021).

	Cambodia	Slovenia	Belgium
Country characteristics in 2020			
5. Population (26)	16.4 million	2.12 million	11.56 million
6. Health expenditure per capita (USD) (27)	116	2417	5009
NCDs			
7. Estimated age-adjusted comparative prevalence of diabetes in adults (20–79 years) in 2021 (27)	7.3%	5.8%	3.6%
8. Diabetes age-standardised death rate in 2019 (28)	42 per 100 000	7 per 100 000	5 per 100 000
9. Hypertension, adults aged 30–79 years in 2019 (28)	26%	45%	30%
10. CVD age-standardised death rate in 2019 (28)	289 per 100 000	126 per 100 000	89 per 100 000

CVD: Cardiovascular Disease

Design and study population

A qualitative, multi-case study design was used with the PHC system in each country being a case. The study population involved PHC practitioners and macro-level stakeholders in order to answer the research questions from organisational and policy perspectives. Primary care practitioners - including physicians, nurses, dieticians, and managers - were chosen from random primary care health facilities in the public sector in each country. Macro-level stakeholders were purposively selected and comprised of people from regulatory authorities, financing organisations, provider umbrella organisations, health care related non-governmental organisations, and research institutes. They were selected purposefully: stakeholders with knowledge or expertise on chronic care organisation in their country were preferred. The numbers of participants from each country are shown in Table 2.

Table 2: participants

	PHC practitioners	Macro-level stakeholders
Cambodia	13 participants	10 participants
Slovenia	8 participants	6 participants
Belgium	21 participants	11 participants

Data collection and analysis

Semi-structured face-to-face and online interviews were carried out by two researchers, KD (GP, Belgium) and a different research-team-member from the respective country (MMa (public health scientist, Belgium), SC (epidemiologist, Cambodia), MMi (GP, Slovenia), or SY (health economist, Cambodia)). The interviews lasted 47 minutes on average and were audio- or video-recorded and transcribed verbatim. The interview guide had four main topics: (a) organisation of chronic care in pre-pandemic times; (b) changes due to COVID-19; (c) major constraints experienced; and (d) facilitators in the health system context that helped to maintain performance during the crisis. There were two slightly different versions of the interview guide (see Appendix 1) with the focus on practice organisation for the primary care practitioners and the focus on overall PHC organisation for the macro-level stakeholders. The interviews with all Cambodian and two Slovenian primary care practitioners were held in their native language, with a translator present. The remaining Slovenian and Cambodian interviews were held in English. The Belgian interviews were held in Dutch.

An inductive thematic analysis was performed, in which an answer was given to the four research questions for every country. All the interviews were read by the first author (KD), after which codes and accompanying explanations were developed, resulting in a codebook. This codebook was discussed, adapted, and approved by all country research teams (SC, MMi and MMa). Researcher triangulation was performed by discussing the data at several stages with the wider team of researchers, who are also familiar with the different contexts. NVivo software version 1.7 was used to support the analytic process. A more in-depth analysis of the Belgian interviews with a focus on differences within the country has been published elsewhere (7).

Results

Cambodia

Direct impact

Concerning the amount of visits for NCD care provided at PHC facilities during COVID-19, some practitioners stated that the quantity of NCD care decreased, where others mainly focussed on the fact that the provision of NCD care was already limited within PHC in Cambodia.

“Before COVID, we had a lot of patients. Now because of COVID, the number of patients declined.” (Practitioner)

“NCDs at public services are not very popular. So the reason that people didn’t come to health centres is not due to COVID, but before COVID they also didn’t come for NCDs.” (Macro-level stakeholder)

On the demand side, respondents noted that patients delayed health care seeking, the main reason being fear of contracting COVID-19 at the facility. In addition, the lockdown reduced access to care because people needed a proof of evidence of the healthcare visit. On the supply side, respondents noted a

difference between the public and private sector facilities. In many places, the private sector frequently closed their doors (or shut down their services), whereas the public sector remained open. Respondents explained this by saying that the staff felt responsible towards keeping the public facilities open, as their duty to provide care for the population. The reasons for closure of private health facilities was explained by regulations, but also by the fear for COVID infection. Private providers are often located in cabinets (private consultation rooms without inpatient capacity) close to the physician's residence, which means that by seeing patients, they would also expose their families to the risk.

"The truth is, we're always scared, all the time, everywhere. But our private cabinet, we don't want people coming in and out infecting our family. Here at the hospital, it's our duty as a government servant. The government did not close offices during COVID. Doctors everywhere have to come to work if they're in the public sector. It's a must for every ministry. Especially in the health sector, we are like the soldier for this battle." (PHC practitioner)

Even if the facilities remained open, staff was often reallocated from the facility to (outside) COVID-19-related services, such as treatment centres and vaccination campaigns. To continue services, some PHC practitioners started to use their phone to communicate with patients. Community health workers have a role in screening and in self-management support for people with chronic diseases in Cambodia. When COVID regulations prohibited visiting patients at home, some community-based health workers adopted their community-based approach and provided their support and care in the health centre. Some CHWs expanded their scope of work and included advise and support in COVID-19 prevention measures.

Respondents also mentioned other areas of impact, such as economic and political. COVID-19 reduces budget at all levels, from the government level (more expenses), the health care facilities (less patients) and at the household level (reduction of employment or labour), which led to austerity in the entire society. For patients, it meant postponement of expenditures on chronic care first, because of the less-urgent nature. The political impact was immense, in the sense that COVID-19-related issues usurped the attention from all other issues, which was visible in the time dedicated by politicians, but also trickled down in all other domains, for instance, in research.

Strengths of the health care system

Respondents recognised that the COVID-19 crisis revealed the strong sense of responsibility in staff as a strong asset of the public health facilities. Health care providers noted that they perceived the public to have trust in their services, when available, illustrated by the observation that people were willing to get vaccinated. Respondents assessed the public vaccination campaign as a big success, reaching high coverage across the entire country.

In catchment areas of MoPoTsyo, respondents also noted the value of a strong community-based support system through that non-government organisation, because they were able to maintain access to chronic care during the pandemic well compared to other areas.

“Before the existence of MoPoTsyo here, the diabetes patients had to travel so far to Phnom Penh to get treatment. Some people could not afford to travel that far so they avoided treatment. So with MoPoTsyo nearby, it helps a great deal. It's near their home and every month they only spend 10 000 or 20 000 riel. They do not have to spend on travelling far. Blood check is cheap, and medicine is also cheap. Even those who are not well off, they can get the care they need.” (PHC practitioner)

Weaknesses of the health care system

The main issue in Cambodia is the quality of NCD care in public health care facilities. Respondents mention the two major and interrelating factors being the lack of material and the competences of health care providers. Continuous medicine supply is the core constraint. PHC practitioners explained that they receive a very limited amount and range of medication and diagnostic materials such as test kits offered to deliver to patients. This was worse during the crisis.

“There are a lot of issues with the medication because we have not been supplied with enough medicines. Generally, the medicines we receive account for just about 30%. The other 70% are bought by us.” (PHC practitioner)

In the hospitals, the supply is often better, but these are further away for most patients. As a consequence, most people with NCDs prefer to visit private practitioners who are widespread, and more accessible than the public health care providers. The capacity of staff in public primary health care facilities is also limited. Health centre personnel - often nurses - have received little training, largely on screening and diagnosis, but less on the treatment and support related and chronic nature of these NCDs. The shift of patients to private facilities reduces the exposure of staff in the health centres to patients with NCD, and makes it difficult to develop and maintain NCD competences.

Some respondents said that also the number of staff was not sufficient for the number and type of patients. This is partly exacerbated by the fact that some health care staff also have a private practice during other hours in the day. This practice was less frequent during COVID-19 pandemic.

Opportunities due to the COVID-19 crisis

The COVID-19 crisis led to an increased focus on health and the health care system. People realised that being healthy is valuable and high-ranked politicians were forced to focus on the health sector, whereas in prepandemic times this was not much a priority. The government expressed the intention to maintain access to essential health care services even in the crisis context, and explicitly recognised that care for NCDs are essential. The successful vaccination campaign also led to many people having a first-ever contact with the public primary health care services. This exposure creates opportunities to increase the utilisation of these services, creating incentives to invest in the public primary health care sector.

“I think one of the things COVID has highlighted is that even during health emergencies, essential services need to be maintained and NCDs is definitely part of essential services. So in that sense, the Cambodian

government has several times emphasised that they want to maintain essential services during this and even future health emergencies. So NCDs will be part of it." (Macro-level stakeholder)

This sudden spotlight on health and health care allowed a discussion on structural problems in the primary health care system. The issue of supply of medication towards primary health care level became part of the political agenda. This translated into an increase of permanent staff capacity at the Ministry of Health, with the assignment to address this issue.

Slovenia

Direct impact

Also in Slovenia, the direct impact of the COVID-19 epidemic on the primary care system and chronic care in particular related to a shift of staff, reduced availability of services, and a reduction in capacity. Some core staff members in the primary care teams—the registered nurses and health promotion nurses—that used to take up the bulk of integrated are for chronic diseases, such as screening, prevention and routine management were all required to take up new duties in the COVID-19 response, such as manning of swab units. This put their regular jobs on hold. Since registered nurses were responsible for most patients with stable chronic diseases (e.g. by inviting them to visit the health care facility), the regular follow-up abruptly halted. The interruption of the routine integrated care system may have long-lasting effects, since the experience and the routine of these registered nurses got lost in some places.

"Care was delayed. That is one of the problems because we mainly dealt with acute problems and these chronic patients didn't come for their annual review and consultation and they even weren't called by their physicians. But of course, also the chronic patients had the fear of coming to us and that is why they also delayed care." (PHC practitioner)

Although patients could theoretically go to a GP instead, the crisis context made it quite difficult to access primary health care providers in general. In the initial phase, the government forbade PHC practices to open. A major observation was that all GPs were overloaded with the extra COVID-19-related tasks mainly consisting of e-mail and phone consultations. Health care providers experienced this as additional burden, and but also noted that this way of working lowered their quality of work. Also, telephone lines and email channels became overloaded and sometimes blocked. For chronic care related tasks, most GPs are poorly reachable.

"And we had an increase, like the emails were increasing plus three to five. It was an increase that was impossible to answer them. And also, the younger patients as well, they saw an opportunity to do something through email and this sounded very easy at the beginning of COVID. But, after a year, we actually saw that this was something we don't want to do because you need to see the patients. There are some health care problems that you can do it through email or through phone." (Practitioner)

Cooperation with the hospital was difficult during COVID-19 times, as some outpatient clinics were closed too, or they demanded a negative COVID-19 swab to accept patients. Larger-scale and lasting

consequences of this crisis were that the additional burden of work and the change in way of working led to quite a number of physicians leaving the profession, respondents said. The pre-existing shortage of GPs was thus further aggravated.

Similar to Cambodia, the COVID-19 crisis affected health-seeking behaviour as well. Even after reopening of PHC services, many people assumed it not possible to visit. Some, especially people with chronic conditions, also feared contracting COVID-19.

Strengths of the health care system

The crisis made respondents aware of the strengths of the primary health care system. First, access to PHC in Slovenia is mostly good. The interruption of the routine work of registered PHC nurses made their function in routine integrated care for stable NCD visible, and showed their role in access to chronic care. Second, the Slovenian health care system is strongly regulated, with clear guidelines and protocols across the system. This standardises care and facilitates effective processes for integrated chronic care, thereby contributing to consistency in quality. Third, respondents said the current situation made them aware of the importance of prevention and proactive care.

“But all in all, I must say that it is exactly this cooperation between public health [health promotion and disease prevention] and primary health care that keeps the focus on health promotion and disease prevention also at primary health care. Without the strong role of public health, primary health care services would be much more medicalised and disease oriented. So it’s quite a strength in Slovenia that you have so much focus on the health promotion especially in primary care.” (Macro-level stakeholder)

Fourth, opinions differed about teamwork. Some said nurses and physicians cooperate well in primary care, facilitating integrated care for many patients. However, others said that nurses and physicians work much too separately, with physicians being consulted only when patient’s health deviates or deteriorates. Due to their relocation to COVID-19 facilities such as swab and emergency care settings, some doctors and nurses learnt to collaborate in new ways, increasing mutual understanding. On the other hand, routine collaboration practice for chronic care was severely affected. Lastly, Slovenia has a strong tradition of community engagement and recognises volunteering as a valuable activity that contributes to the well-being of society. The crisis catalysed this potential, with many volunteers who took up health care related tasks in their communities.

Weaknesses of the health care system

According to respondents, the major constraints in the PHC in Slovenia are the shortage of personnel, of both doctors and nurses, which was further exacerbated by the COVID-19 crisis. The shortage of GPs was attributed to both low instream and high attrition. Relatively few medical students opt for a profession as GP, partly because of the lower status and remuneration of the PHC sector in comparison to hospitals. Working in the community health centres, which make up a large part of the primary health care sector in Slovenia, GPs experience a high administrative burden and long working hours. Quite a number of

doctors resign, to search employment in private practice or in companies, contributing to a vicious circle. This makes the shortage of PHC staff an urgent problem.

“So there is a very serious lack of primary health care physicians. We are seeing that some of them are leaving community health centres and prefer operating as concessioners or even as freelance physicians, working on the contract basis either with community health centres or concessioners. Which means that they don’t operate their own registered list of patients, which is a problem.” (Primary care practitioner)

Consequences of the shortage of GPs are that not all people are able to register with any of them, that waiting times for consultations are increasing, and that quality is declining. Respondents note a lack of attention for, and stimulation of, quality of care. Despite the integrated chronic care organisation, health care provider respondents noted that some patients with chronic diseases have a high frequency of consultations and that the routine of self-management is underdeveloped. This puts a high burden on the limited time of health care workers (HCWs).

Another weakness of the PHC system that was illuminated by the COVID-19 crisis was the inflexible financing system of community health centres. They are largely paid for face-to-face consultation, and not for additional tasks. This makes, especially the larger organisations with many staff members, vulnerable to times of reduced consultations such as in the COVID-19 crises.

Opportunities due to the COVID-19 crisis

Respondents said both the public and the politicians began to value the importance of PHC as essential to the health system, as PHC practitioners were successful in triaging COVID-19 patients and preventing the hospital system from overflooding. This has led to additional resources and innovations in PHC organisation. The government decided to increase wages for PHC physicians and to add an additional staff member to the primary care teams, the administrator, with the intention to lower the administrative burden.

Consultations without appointment were abolished. HCWs appreciated this change, not only because of the improvement of patient flows, but also because they perceived that physicians feel more valued, because the appointments make patients feel that the physician’s time is precious. The high burden of phone consultations and e-mail consultations also led to innovations. A platform was created to streamline these requests, and in one region a new educational program was created to support patients with long COVID. To improve the quality of care, health centres introduced experimental remote care models that included pulse oximetry and consultations for patients with COVID. A national COVID telemonitoring centre was also established.

Health care workers noted that working in a different way during the crisis was enriching, because people had to do other tasks, and they got to know other people in a different way. Working on common goals towards overcoming the crisis was good for the team spirit, respondents said.

“But this situation showed them [patients] that they can get appointment time. It means when the process will go further, they will understand that we are not on the market. And they have to claim their visits and they have to think about their problems, what will they present to the doctors. Not just a call ‘Oh, I have a problem, what [...]’ That they have to become more organised.” (Macro-level stakeholder)

Belgium

Direct impact

The direct impact on the supply of PHC related to the availability of services, the change of working mode, and the income for GPs. In Belgium, at the start of the COVID-19 crisis, the government required PHC practices to restrict opening to urgent cases, in order to contain the virus. Thus, there were fewer consultations for patients with chronic diseases. As a result, HCWs switched to alternative modes of consultations. Teleconsultations were implemented, and as the crisis progressed, they were also reimbursed. Like in the other countries, the drop of patients led to a drop of income for GPs. Some GPs needed to temporarily discharge their staff. The government’s decision to allow primary care facilities to fully open again coincided with COVID-19 testing becoming widely available. The latter imposed a huge administrative burden on PHC practices to follow up on testing, on results and to explain the consecutive quarantine measures to patients. As in Slovenia, it made some GPs deciding to leave the profession and a number of older professionals to decide on early retirement.

“Yes, I think there is a huge fatigue. Yes, people feel they can’t take anything on right now.” (PHC practitioner)

Strengths of the health care system

The COVID-19 crisis revealed three characteristics of the Belgium PHC system and society that proved to be strong assets. Firstly, many people got engaged to help in providing support to public services, from volunteers, to practitioners, and people on regional or national governmental levels, such as in vaccination and triage centres. Secondly, patients perceive the care of PHC providers as very patient-centred and of high quality. Thirdly the entrepreneurship of PHC practitioners in Belgium, leaving enough freedom to take useful initiatives is an important strength. Practitioners have been flexible in providing care, such as working many more hours to serve their population.

“We come very much from a liberal, unregulated health care system, which is why we see that we can achieve a lot from personal initiatives. And I think that is something we actually need to preserve. We don't want to move towards an over-regulated system where personal initiative is no longer possible.” (Macro-level stakeholder)

Weaknesses of the health care system

Despite the recognition of the general high quality of care by patients, the potential of PHC for good quality integrated chronic care has not yet been realised. Whereas chronic care requires pro-active

management, many primary health care are organised to provide reactive care. Respondents noted that the current PHC organisation is not yet good enough from that perspective. The majority of PHC practitioners work in monodisciplinary practices and have few options for multidisciplinary care for their patients, for instance due to lack of space or budget for nurses that could be hired. Moreover, the current fee-for-service payment system does not stimulate physicians to delegate tasks. Most PHC practitioners have no routine to assess the status of and needs of their patient group as a whole for instance by analyses the data of the health information system built up by the electronic medical files. This also reduces their capacity to organise proactive care management for people with chronic diseases. All primary healthcare workers became usurped in the COVID-19 crisis by the increasing health care demands. But practices that have proactive systems in place were better able to reorganise and adapt to the crisis context.

“So through COVID it became even clearer what was already dormant, that how we currently organise general practice, that that is not sustainable to deliver resilient care. That within the fee-for-service system you have no incentive to proactively organise your care because people know that you end up seeing people less often and so you earn less.” (Macro-level stakeholder)

Like in Slovenia, the relative shortage of GPs was aggravated during the COVID-19 crisis. The increased medical and administrative burden led to higher attrition rates. The PHC sector is comprised of small-scale entrepreneurs, with little intrasectoral organisation. This lack of organisation, especially when compared with hospitals, makes it more difficult for the government to guide and coordinate actions efficiently.

Opportunities due to the COVID-19 crisis

Respondents said they believed the crisis changed something in the mind of the GPs, which might provide opportunities for more integrated care. GPs realise that they have to change their organisation in order to be crisis- and future-proof.

“Because I am sure that the COVID pandemic has led to some kind of existential crisis in many practices. Where that a lot of practices have asked themselves the question of ‘what on earth are we all doing?’ There was a lot of administration involved as well. A lot of GPs felt like they were a walking stamping pad. And I think that, especially in light of the chronic care pandemic, we really need to look at how we can give those GP practices the necessary tools to be able to transform into a different care model where chronic care is given an important place with population management and towards integrated care.” (PHC practitioner)

The growing awareness GPs in the field also gave a push to the discussion of reform of PHC at higher level. Since teleconsultations turned out to be vital to continue consultations with patients during the crisis, so the health financing organisation decided upon a mode for reimbursement, which was otherwise not foreseen in the short term. Respondents also pointed out that the discussion on how the integration of nurses into primary care practice can be made possible got new impetus. The ministry of health

started a reform process to develop an alternative model of primary care practice organisations that would allow for multidisciplinary working and integrated chronic care supported by a provider payment system based on a mix of capitation fees and services delivered. In Flanders, the newly erected primary care zones had been started to develop their thinking about population management for chronic diseases, when the COVID-19 crisis gave them new tasks (vaccination) which increased their visibility and agency. COVID-19 also led to the accelerated development of tools to monitor population health. For instance, the COVID-barometer allowed primary care practices to easily extract data on COVID-19 infections and vaccinations, which could then fed into the development of COVID-19 dashboards at multiple levels. This development is widening in scope towards other mainly chronic diseases. Like in Slovenia, the pandemic led to increased recognition of the importance of a strong primary health care system which supported political decisions to invest in these developments.

Discussion

The COVID-19 crisis has had an important impact on PHC systems worldwide. Regardless of the epidemiology of COVID-19, all three countries in our study have experienced serious disruption in care provision for patients with chronic diseases, but there are also differences both in impact and response. The first part of this discussion will focus on the similarities and the common lesson that can be drawn, and the second part on the differences in the view of their respective health system context.

In all three countries, patients with chronic diseases were afraid that they would contract COVID-19 at the health facilities, which withheld them from visiting in person, decreasing demand for health care – at least for a certain phase in the epidemic phase. Also HCWs themselves were afraid of getting infected, and quite many have been infected during the course of the epidemic. This limited the provision of care. COVID-19 was prioritised in all countries and developments in the field of chronic care were halted or pushed back. International research (29), as well as country-specific reports (30, 31) support the finding that care for patients with chronic diseases was substantially affected during the pandemic.

A series of developments increased the burden of work for HCWs. First, there was a drop in physical consultations, the ‘old’ work, as described above, which meant a decrease in income for the health facilities or the HCWs in all three countries. Second, there was an important amount of ‘new’ activities—COVID-19-related tasks, teleconsultations, and administrative tasks reaching unprecedented heights. Thirdly, regular care delivery was interrupted by reallocation of staff to COVID-19 services and by staff absenteeism either because of illness or quarantine measures. Altogether, these developments put a high burden on the available staff (32), which lead to high levels of distress, anxiety, burnout, and depression (33–35), with HCWs in smaller teams suffering more (13), putting primary care practitioners (36) and especially those in small practices at higher risk. The fact that these factors may be some of the reasons behind HCWs’ intentions to leave the sector (37–40) is even more alarming and should wake-up stakeholders to take action.

Another similarity is the fact that health care, and to a certain extend also PHC, gained importance in the eyes of the public and of politicians. People valued the importance of good health, and governments have mobilised more resources to fight COVID-19 (41). Although there were hopes that budget increases will be sustained (42), people also recognise other new upcoming crises and threats to investments, such as economic crises and inflation following the economic shock from the COVID-19 pandemic (43).

A last similarity is that in each of the three countries, COVID-19 made it possible for innovations to emerge and be scaled up more quickly. Examples are dashboards for population monitoring in Belgium, a communication platform for patients in Slovenia, and an online vaccination registration in Cambodia. The development of these innovations can have spill-over effects to chronic diseases and contribute to improving integrated care more widely. In Belgium and Slovenia, primary health care practitioners themselves also became more open to changes in the organisation of care, in order to be more efficient. They did that, for instance, by only allowing pre-booked appointments. These adaptations are recognised by other researchers and valuable in upgrading PHC (44, 45). The biggest innovation at the level of health care delivery, at least in Slovenia and Belgium, was the introduction of teleconsultations. It is clear that telemedicine is here to stay (45). The potential negative consequences and risks are clearly recognised such as widening the gap between the advantaged and the disadvantaged (46), and the doubts about the quality of such consultations (47). However, the wider implementation has also shown good examples, where for instance, telemedicine helped the deprived gain access to care (48). Keys to successful scale-up relate to the user-friendliness of the application, structural integration of telemedicine in the primary care organisation supported by the right financial mechanisms (49). An important observation in both Slovenia and Belgium was that the current way of financing PHC system is not fit for these changes that were necessary in crises situations and that allow better integrated chronic care. Our findings are in line with other research, which points to capitation-based being more appropriate to support continuity for patients with chronic diseases (42, 46, 50).

The differences found in the response to COVID-19 in the three countries highlights a number of strengths and vulnerabilities of each system. In Cambodia, a strong civil servant ethos was observed during the pandemic, but this may not be enough to overcome the obstacles of restricted budgets and lack of medicines, two issues becoming more apparent in this crisis. An important asset was the community engagement and systems built in place, which were able to complement health services. In Slovenia, the strong central leadership which had developed uniform procedures for prevention and care in the primary health care system across the country and the ministry could build its crisis response upon this common structures, for instance through reallocation of staff to COVID duties. The downside was that there was little flexibility to overcome the pre-existing weakness of staff shortages. This was different in Belgium, where freedom of HCWs and entrepreneurship are highly valued. There were no mandatory reallocations of staff, but HCWs voluntary combined their routine practice with additional COVID-related tasks, making very long hours. Belgium reached high testing rated and vaccination coverage, partly because of the flexibility of health care providers and the entrepreneurship within the sector. However, due to the fragmentation of power across different levels (51) and diversity in primary health care organisation, it

takes more time to create uniform guidance and efficient coordination in the primary care system, which may be important in crisis times, but also for chronic diseases.

The strengths of our study are that we sampled both high and mid-level stakeholders and practitioners in three very different countries, with different health systems, and different COVID-19 epidemics. The limitations of our study relate to the patients' and private providers' viewpoints that are missing. They might have valuable perspectives that shed a different light. Next, the analysis was limited to three countries, which certainly does not reflect the complete variance of health care systems over the world. However, choosing three countries allowed deep understanding of those cases.

Conclusions

Moments of crisis and disruption lay bare the structural agility and gaps more clearly, as a magnifying glass (42, 47). Our study has implications for chronic care in each of the countries examined. In Cambodia, in order to build a stronger PHC system, there is a strong need to prioritise sustainable supply of medicines. In Slovenia, special attention should be paid to the shortage of GPs, the administrative burden, and the insufficient digitalisation of the health system. In Belgium, macro-level stakeholders and practitioners should rethink primary care practice organisation. Our study provide the opportunity for other health care systems to analyse their response to the COVID epidemic and other crises, uncovering strengths and weaknesses.

Abbreviations

COVID-19	Coronavirus Disease 2019
CVD	Cardiovascular Disease
GP	General practitioner
HCW	Health Care Worker
NCDs	Noncommunicable Diseases
OD	Operational Health District
PEN	Package of Essential Noncommunicable Disease Interventions
PHC	Primary Health Care
SCUBY	Scale-Up of diaBetes and hYpertension
T2D	Type 2 Diabetes
USD	U.S. Dollar
WHO	World Health Organisation

Declarations

Ethics approval and consent to participate

Ethics approval was received by the Institutional Review Board of the Institute of Tropical Medicine in Belgium with number 1323/19 and by the National Ethics Committee for Health Research of the Ministry of Health in Cambodia with number 071. All methods were carried out in accordance with the approved research plan. Informed consent was signed by all participants, this consent form was translated in the local language.

Consent for publication

Not applicable

Availability of data and materials

The data that support the findings of this study are available on request from the corresponding author KD. The data are not publicly available due to them containing information that could compromise participant privacy.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

KD, MMa, SC, MMi, SY, APS, WVC, EW and JVO contributed to the design of the study. Data collection was performed by KD, MMa, SC, MMi and SY. Data analysis was performed by KD, MMa, SC, MMi and CM. KD, MMa, SC, MMi, SY, APS, WVC, CM, EW and JVO contributed to the final manuscript and approved it.

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References

1. Van Damme W, Dahake R, Delamou A, Ingelbeen B, Wouters E, Vanham G, et al. The COVID-19 pandemic: diverse contexts; different epidemics-how and why? BMJ Glob Health. 2020;5(7).
2. Hoffman Maayan NCDA: Investing In Cost-effective NCD Policies Now, Could Save Lives And Money Later. 2022. Available from: https://healthpolicy-watch.news/ncda-investing-in-cost-effective-ncd-policies-now-could-save-lives-and-money-later/.
3. Van Poel E, Vanden Bussche P, Klemenc-Ketis Z, Willems S. How did general practices organize care during the COVID-19 pandemic: the protocol of the cross-sectional PRICOV-19 study in 38 countries. BMC Prim Care. 2022;23(1):11.
4. World Health Organization: Regional Office for the Western Pacific. Adressing noncommunicable diseases in the COVID-19 response. 2020. Available from: https://apps.who.int/iris/handle/10665/331923?locale-attribute=fr&.
5. Favas C, Ansbro E, Eweka E, Agarwal G, Lazo Porras M, Tsiligianni I, et al. Factors Influencing the Implementation of Remote Delivery Strategies for Non-Communicable Disease Care in Low- and Middle-Income Countries: A Narrative Review. Public Health Rev. 2022;43:1604583.
6. Clark A, Jit M, Warren-Gash C, Guthrie B, Wang HHX, Mercer SW, et al. Global, regional, and national estimates of the population at increased risk of severe COVID-19 due to underlying health conditions in 2020: a modelling study. Lancet Glob Health. 2020;8(8):e1003-e17.
7. Danhieux K, Buffel V, Pairon A, Benkheil A, Remmen R, Wouters E, et al. The impact of COVID-19 on chronic care according to providers: a qualitative study among primary care practices in Belgium. BMC Fam Pract. 2020;21(1):255.
8. Sarti TD, Lazarini WS, Fontenelle LF, Almeida A. What is the role of Primary Health Care in the COVID-19 pandemic? Epidemiol Serv Saude. 2020;29(2):e2020166.
9. Krist AH, DeVoe JE, Cheng A, Ehrlich T, Jones SM. Redesigning Primary Care to Address the COVID-19 Pandemic in the Midst of the Pandemic. Ann Fam Med. 2020;18(4):349-54.
10. Mash B. Primary care management of the coronavirus (COVID-19). S Afr Fam Pract (2004). 2020;62(1):e1-e4.
11. Windak A, Frese T, Hummers E, Klemenc Ketis Z, Tsukagoshi S, Vilaseca J, et al. Academic general practice/family medicine in times of COVID-19 - Perspective of WONCA Europe. Eur J Gen Pract. 2020;26(1):182-8.
12. Siebenhofer A, Scott AM, Avian A, Terebessy A, Mergenthal K, Schaffler-Schaden D, et al. COVI-Prim international: Similarities and discrepancies in the way general practices from seven different

countries coped with the COVID-19 pandemic. Front Public Health. 2022;10:1072515.

13. Collins C, Clays E, Van Poel E, Cholewa J, Tripkovic K, Nessler K, et al. Distress and Wellbeing among General Practitioners in 33 Countries during COVID-19: Results from the Cross-Sectional PRICOV-19 Study to Inform Health System Interventions. Int J Environ Res Public Health. 2022;19(9).
14. Collins C, Van Poel E, Santric Milicevic M, Tripkovic K, Adler L, Bjerve Eide T, et al. Practice and System Factors Impact on Infection Prevention and Control in General Practice during COVID-19 across 33 Countries: Results of the PRICOV Cross-Sectional Survey. Int J Environ Res Public Health. 2022;19(13).
15. Gilson L, Marchal B, Ayepong I, Barasa E, Dossou JP, George A, et al. What role can health policy and systems research play in supporting responses to COVID-19 that strengthen socially just health systems? Health Policy Plan. 2020;35(9):1231-6.
16. Martens M, Wouters E, van Olmen J, Klemenc Ketis Z, Chhim S, Chham S, et al. Process evaluation of the scale-up of integrated diabetes and hypertension care in Belgium, Cambodia and Slovenia (the SCUBY Project): a study protocol. BMJ Open. 2022;12(12):e062151.
17. van Olmen J, Menon S, Poplas Susic A, Ir P, Klipstein-Grobusch K, Wouters E, et al. Scale-up integrated care for diabetes and hypertension in Cambodia, Slovenia and Belgium (SCUBY): a study design for a quasi-experimental multiple case study. Glob Health Action. 2020;13(1):1824382.
18. World Health Organization: Regional Office for the Western Pacific. The Kingdom of Cambodia health system review. Manilla. 2015.
19. World Health Organization. Package of essential noncommunicable (PEN) disease interventions for primary health care in low-resource settings. Geneva: World Health Organization; 2010.
20. Chhim S, Te V, Buffel V, van Olmen J, Chham S, Long S, et al. Healthcare usage and expenditure among people with type 2 diabetes and/or hypertension in Cambodia: results from a cross-sectional survey. BMJ Open. 2023;13(1):e061959.
21. Susič AP, Švab I, Klemenc Ketiš Z, World Health Organization. Regional Office for Europe. Upgrading the model of care in family medicine: a Slovenian example. Public health panorama. 2018;04(04):550-5.
22. Van Wilder L, Devleesschauwer B, Clays E, De Buyser S, Van der Heyden J, Charafeddine R, et al. The impact of multimorbidity patterns on health-related quality of life in the general population: results of the Belgian Health Interview Survey. Qual Life Res. 2022;31(2):551-65.
23. Danhieux K, Martens M, Colman E, Wouters E, Remmen R, van Olmen J, et al. What Makes Integration of Chronic Care so Difficult? A Macro-Level Analysis of Barriers and Facilitators in Belgium. Int J Integr Care. 2021;21(4):8.
24. Dong E, Du H, Gardner L. An interactive web-based dashboard to track COVID-19 in real time. Lancet Infect Dis. 2020;20(5):533-4.
25. Hale T, Angrist N, Goldszmidt R, Kira B, Petherick A, Phillips T, et al. A global panel database of pandemic policies (Oxford COVID-19 Government Response Tracker). Nat Hum Behav. 2021;5(4):529-38.

26. United Nations. Department of Economic and Social Affairs. Population Division. World Population Prospects 2022, On line edition. 2022.
27. World Health Organization. Global Health Observatory Data Repository. 2022.
28. Noncommunicable Diseases Data Portal [Internet]. 2023. Available from: https://ncdportal.org/.
29. Gadsden T, Downey LE, Vilas VDR, Peiris D, Jan S. The impact of COVID-19 on essential health service provision for noncommunicable diseases in the South-East Asia region: A systematic review. Lancet Reg Health Southeast Asia. 2022;1:100010.
30. Van den Bulck S, Crevecoeur J, Aertgeerts B, Delvaux N, Neyens T, Van Pottelbergh G, et al. The impact of the Covid-19 pandemic on the incidence of diseases and the provision of primary care: A registry-based study. PLoS One. 2022;17(7):e0271049.
31. Oblak T, Vidnar N, Pribakovic Brinovec R. Integrated Primary Care and Public Health: A Case Study of Multidisciplinary Rehabilitation and Lifestyle Intervention in Persons With Post-COVID-19 Condition. Int J Public Health. 2022;67:1605287.
32. Chhim S, Ku GM, Mao S, van de Put W, Van Damme W, Ir P, et al. COVID-19 in Cambodia, January 2020–June 2022: a success story. medRxiv. 2023.
33. Lum A, Goh YL, Wong KS, Seah J, Teo G, Ng JQ, et al. Impact of COVID-19 on the mental health of Singaporean GPs: a cross-sectional study. BJGP Open. 2021;5(4).
34. Batra K, Singh TP, Sharma M, Batra R, Schvaneveldt N. Investigating the Psychological Impact of COVID-19 among Healthcare Workers: A Meta-Analysis. International Journal of Environmental Research and Public Health. 2020;17(23):9096.
35. Serrano-Ripoll MJ, Meneses-Echavez JF, Ricci-Cabello I, Fraile-Navarro D, Fiol-deRoque MA, Pastor-Moreno G, et al. Impact of viral epidemic outbreaks on mental health of healthcare workers: a rapid systematic review and meta-analysis. J Affect Disord. 2020;277:347-57.
36. Valaine L, Ancāne G, Utināns A, Briģis Ģ. Mental Health and Associated Demographic and Occupational Factors among Health Care Workers during the COVID-19 Pandemic in Latvia. Medicina. 2021;57(12):1381.
37. Halcomb E, McInnes S, Williams A, Ashley C, James S, Fernandez R, et al. The Experiences of Primary Healthcare Nurses During the COVID-19 Pandemic in Australia. J Nurs Scholarsh. 2020;52(5):553-63.
38. Sinsky CA, Brown RL, Stillman MJ, Linzer M. COVID-Related Stress and Work Intentions in a Sample of US Health Care Workers. Mayo Clin Proc Innov Qual Outcomes. 2021;5(6):1165-73.
39. Schug C, Geiser F, Hiebel N, Beschoner P, Jerg-Bretzke L, Albus C, et al. Sick Leave and Intention to Quit the Job among Nursing Staff in German Hospitals during the COVID-19 Pandemic. International Journal of Environmental Research and Public Health. 2022;19(4):1947.
40. Tabur A, Choudhury A, Emhan A, Mengenci C, Asan O. Clinicians’ Social Support, Job Stress, and Intent to Leave Healthcare during COVID-19. Healthcare. 2022;10(2):229.
41. Rahim F AR, Baaroy H, Gores L, Kutzin J. COVID-19 funds in response to the pandemic. Washington, DC, WA: International Monetary Fund; 2020.

42. Hanson K, Brikci N, Erlangga D, Alebachew A, De Allegri M, Balabanova D, et al. The Lancet Global Health Commission on financing primary health care: putting people at the centre. Lancet Glob Health. 2022;10(5):e715-e72.
43. Kurowski C ED, Tandon A, Eozenou PH-V, Schmidt M, Irwin A, Salced Cain J, Pambudi ES, Postolovska I. From Double Shock to Double Recovery : Implications and Options for Health Financing in the Time of COVID-19. Washington, DC, WA.; 2021.
44. Nilsen P, Fernemark H, Seing I, Schildmeijer K, Skagerstrom J. Seven lessons from the coronavirus pandemic for primary health care: A qualitative study of registered and assistant nurses in Sweden. Scand J Caring Sci. 2022;36(4):1197-205.
45. Albert SL, Paul MM, Nguyen AM, Shelley DR, Berry CA. A qualitative study of high-performing primary care practices during the COVID-19 pandemic. BMC Fam Pract. 2021;22(1):237.
46. Hansmann KJ, Chang T. Defining the "New Normal" in Primary Care. Ann Fam Med. 2021;19(5):457-9.
47. Khalil-Khan A, Khan MA. The Impact of COVID-19 on Primary Care: A Scoping Review. Cureus. 2023;15(1):e33241.
48. Bekasi S, Girasek E, Gyorffy Z. Telemedicine in community shelters: possibilities to improve chronic care among people experiencing homelessness in Hungary. Int J Equity Health. 2022;21(1):181.
49. Meurs M, Keuper J, Sankatsing V, Batenburg R, van Tuyl L. "Get Used to the Fact That Some of the Care Is Really Going to Take Place in a Different Way": General Practitioners' Experiences with E-Health during the COVID-19 Pandemic. Int J Environ Res Public Health. 2022;19(9).
50. Tu K, Sarkadi Kristiansson R, Gronsbell J, de Lusignan S, Flottorp S, Goh LH, et al. Changes in primary care visits arising from the COVID-19 pandemic: an international comparative study by the International Consortium of Primary Care Big Data Researchers (INTRePID). BMJ Open. 2022;12(5):e059130.
51. Martens M, Danhieux K, Van Belle S, Wouters E, Van Damme W, Remmen R, et al. Integration or Fragmentation of Health Care? Examining Policies and Politics in a Belgian Case Study. Int J Health Policy Manag. 2021;11(9):1668-81.

Figures

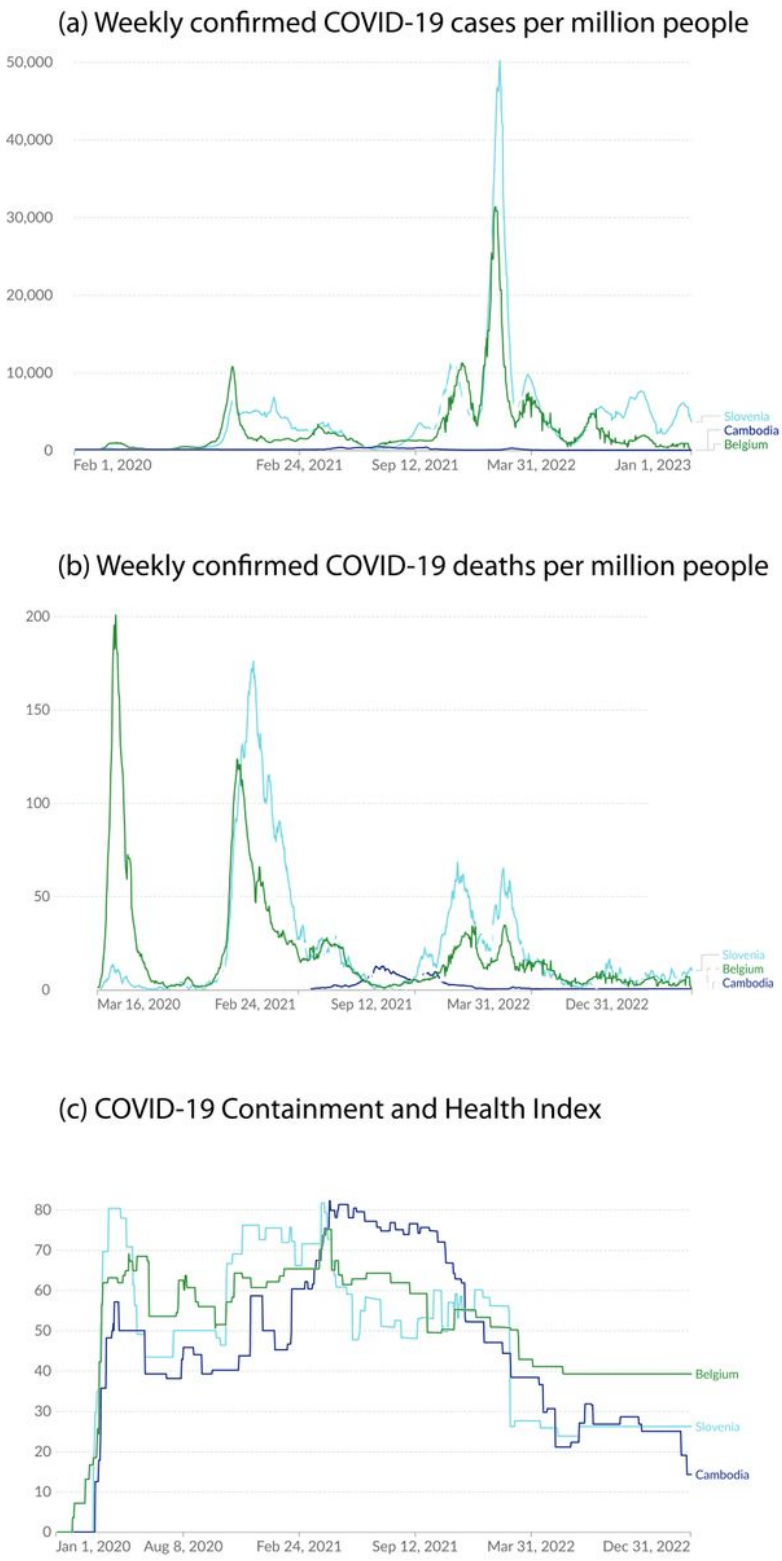

Figure 1

Weekly confirmed (a) COVID-19 cases per million people; (b) COVID-19 deaths per million people;and (c) COVID-19 Containment and Health Index

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- InterviewguidCOVIDimpactchroniccare.docx