Step 2.3 Overview of a public health response

In this mini-lecture, Dr Olivier Le Polain, discusses general principles and key elements of a response, including the main considerations for different epidemic contexts. This lecture is an updated version of that included in the first iteration of the MOOC. Whilst the key public health principles remain, the lecture includes some amendments to account for the change in the global picture, recorded 4th March 2020. As you watch the lecture, can you think about the phase your country is currently in? Can countries go back and forth between phases?

Many people found the "Report of the WHO-China Joint Mission on Coronavirus Disease 2019 (COVID-19)" with more details on the emergence of the disease in China interesting in the first version of the course, so you may want to read that in the See Also information below.

Video transcript:

OLIVIER LE POLAIN: Strategic objectives may differ slightly in each country or organisation, but the main overall objectives should be broadly similar. The response first aims to limit onward spread in the community and break chains of transmission to stem the epidemic quickly, or at least slow progression. Stemming transmission is essential when sporadic cases or a few clusters are being diagnosed in a new area.

And slowing transmission is important when there is widespread community transmission to reduce the burden on health care services, as well as protecting vulnerable people from being infected. For many countries that have had to go into lockdown, having strategies in place ensure that transmission remains at a low level, and the reproduction number below one is a precondition to reducing restrictions in place. Second, the focus should be on ensuring adequate clinical care, particularly of vulnerable patients, and have the necessary referral pathways so that people can be appropriately directed to health care. This may require building additional hospitals to ensure enough capacity.

Third, it is important to address knowledge gaps and accelerate the development of new tools, vaccines, and treatments that may help prevent disease spread and improve outcomes. Accelerating research is essential to improve the future response. Overall, the ultimate objective is to decrease mortality and to limit the health, economic, and wider social impacts of the epidemic on populations. This lecture will focus only on the public health response, but it is important to understand that given the impact on every aspect of society, any response is multisectoral and involves the highest levels of government. Now, we will look at some key measures in place in any response. While public health principles are similar across settings, their

implementation will vary depending on capacity, context, and importantly on the dynamics of the epidemic within a given setting or given country. There are, however, a number of key measures that will be implemented in any response, which I'm going to summarise here.

Surveillance is the backbone of any public health response. Prompt notification of people with suspected infection is required to rapidly detect and isolate cases and identify and isolate their contacts. Surveillance is also important to monitor trends, monitor hospital capacity, and monitor epidemic dynamics to help steer public health strategy.

Screening at points of entry is a component of surveillance, which is undertaken to identify people ill on arrival and limit the risk of people importing infection to new and potentially unaffected areas. While not always necessarily effective identifying all cases, entry screening may be a useful way to provide information to people on what to do if they become unwell, where to seek care, and especially early on in an outbreak.

Contact tracing refers to the identification and monitoring of close contacts of confirmed cases. This is a key measure to stem transmission and a way to identify new cases early and to prevent contacts from transmitting to other people should they become unwell. Countries trying to ease their restrictions should look to increase capacity for contact tracing to help keep transmission low. Doing so requires a substantial contact tracing workforce and a large-scale testing capacity.

Physical distancing measures have been put in place in most settings to reduce transmission. China cordoned off entire cities. Many other countries have implemented far-reaching restrictions on activities and travel, drastically reducing contacts and limiting disease spread. Tailored approaches to physical distancing will be required in most settings to help reduce transmission in combination with other activities, such as contact tracing.

Regular public communication is essential to ensure understanding about why measures are being put in place and provide guidance on individual protective measures that can be taken, as well as gaining support for the response itself. An effective public health response needs engagement of everyone at every level through clear communication. In health care facilities, the focus will be on clinical management. This includes identification and isolation of suspected cases, identifying those at risk of severe disease, and provide them with appropriate supportive treatment. Infection prevention and control includes ensuring adequate personal protective equipment for all health care staff. Health care workers are at particular risk, given their constant proximity to people with the disease.

Laboratory capacity is needed on multiple fronts. Being able to test every case is necessary for contact tracing, and particularly important among health care workers. Serological testing in the population can provide estimates of the proportion of the population infected and help deliver public health strategies.

Given the novel nature of the epidemic, developing guidance and guidelines for all aspects of the response is essential. It is also an iterative process that needs to be

updated as new evidence becomes available. Research is an integral part of the response and will be discussed further in week 3. Finally, ensuring an appropriate logistics pipeline is a crucial and difficult task to maintain supplies to respond to the outbreak. The measures outlined will be implemented in various ways, depending on the stage of the epidemic and local context. Conceptually, it's useful to describe the epidemic response for three different scenarios. First, in the absence of known cases, the focus should be on readiness. This means ensuring appropriate surveillance is in place and all other mechanisms of the response are in place to ensure the entire system stands ready to respond.

Secondly, the focus should be on rapidly breaking transmission chains and containing the outbreak. This is done through meticulous contact tracing, self-isolation and other social distancing measures, and ensuring suspected cases can be rapidly identified, isolated, and tested.

Thirdly, with more widespread person-to-person transmission in the community, early containment may no longer be possible, and the focus is on slowing transmission. The main purpose here is to avoid rapid increase in cases that would put pressure on the health care system whilst trying to keep the epidemic under control. This, of course, is a simplification, and in many instances, response strategies will include elements of broad containment and mitigation measures. Within the country, the epidemic may be at different stages, at different times, in different areas.

Let's now briefly consider how this is all coordinated. The public health measures should be embedded in a multisectoral response and well-coordinated response structure. Generally speaking, existing emergency response mechanisms should be activated. These have various response functions, termed pillars or cells around specific measures. For example, a contact tracing pillar, a broad health pillar, and so on.

Good governance is essential, and most governments have mobilised the highest levels into response to COVID-19. International coordination is crucial, and there is an important role for the WHO, UN, and other international organisations. Information sharing between countries is also important, with immediate notification of new cases to all member states. There is also a need for sharing of materials, including guidance, standard operating procedures, scientific outputs, and research protocols.

Now, let's look at what was just described in the context of China's experience. Early in January 2020, with the city of Wuhan as the epicentre of the outbreak, focus was on containment measures, limiting exportation of cases from the city of Wuhan in Hubei province to other provinces, rapidly developing guidelines and testing capacity, and setting up all response pillars.

At the time, China abruptly set up a national multisectoral response coordinated at highest level.

As cases rapidly increased, efforts on containing and mitigating the outbreak were done through what was, at a time, seen as extraordinary response measures, including extreme physical distancing and cordoning off of entire cities, limiting population movement and building new hospitals. Some of those measures have since been

implemented in other countries. As cases stabilised and the incidents started to decrease, the focus was on ensuring social economic recovery while maintaining and strengthening response activities. A comprehensive research programme was also put in place to inform national and international efforts. The response was once described as perhaps the most ambitious, agile, and aggressive disease containment effort in history in a report of a joint WHO China mission on coronavirus.

Other countries have had different experiences and different interventions. South Korea has, through high levels of testing and intensive contact tracing, been able to contain the outbreak with less draconian population restrictions. Europe and the US, for example, have implemented restrictions in various forms and are now trying to plan to ease some of those measures.

In more fragile settings, both surveillance and response capacity may be more limited and populations may be vulnerable to severe disease. The focus here is on adapting strategies focused on physical distancing and protecting the most vulnerable from infection. In all this, global coordination and communication at all levels is essential. It requires strong leadership and for countries to act together to prevent epidemic spread.

See Also

Report of the WHO-China Joint Mission on Coronavirus Disease 2019 (COVID-19)

https://www.who.int/docs/default-source/coronaviruse/who-china-joint-mission-on-covid-19-final-report.pdf

COVID-19: towards controlling of a pandemic

https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)30673-5/fulltext#box1

COVID-19 policy tracker

https://www.health.org.uk/news-and-comment/charts-and-infographics/covid-19-policy-tracker

Policy responses to COVID-19

https://www.imf.org/en/Topics/imf-and-covid19/Policy-Responses-to-COVID-19