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What Is a Zero-COVID Strategy and How Can It Help Us Minimise the Impact of the Pandemic?

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[This is the 26th document in a series of discussion notes addressing fundamental questions about COVID-19 and response strategies. These documents are based on the best scientific information available and may be updated as new information comes to light.]

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The strategy of **control and maximum suppression**[1] (**zero-COVID**[2,3]) has been implemented successfully in a number of countries *(see Figure 1)*. The objective of this strategy is to keep transmission of the virus as close to zero as possible and ultimately to eliminate it entirely from **particular geographical areas**. The strategy aims to increase the capacity to identify and trace chains of transmission and to identify and manage outbreaks, while also integrating economic, psychological, social and healthcare support to guarantee the isolation of cases and contacts. This approach is also known as **"Find, Test, Trace, Isolate and Support" (FTTIS)**[4]. The more coordinated, flexible and effective the process, the easier it is to curb the circulation of the virus and keep the number of cases close to zero. Likewise, the lower the incidence of infection, the more effective the strategy is and the easier it becomes to slow the pandemic and mitigate its impacts on health, society and the economy.

As a public health strategy, it is important to distinguish maximum suppression from the strategy of seeking to end the pandemic by gradually allowing the population to become infected. This approach, known as **herd immunity**[5], can be a **lengthy and costly way to control an epidemic**, especially for groups at higher risk of severe disease. It also disproportionately affects the most econom-

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[4] A similar approach was proposed in the United Kingdom in *The Independent SAGE Report 5*. 17 June 2020.

[5] Jones D, Helmreich S. A history of herd immunity. *The Lancet*. September 2020. 396(10254), 810–811.

ically and socially vulnerable individuals and communities. From the standpoint of the **precautionary principle**, a herd immunity approach is inadvisable because we have a limited understanding of the duration of immunity, the long-term impact of the disease, the behaviour of the disease in successive reinfections, and the associated rates of morbidity and mortality.

The maximum suppression strategy should also be distinguished from **containment or mitigation strategies** aimed at preventing the health system from being overwhelmed **("flattening the curve")**. Even though mitigation strategies are useful when community spread is already very high and impacting the health system, they have an important weakness: they **fail to address periods of low transmission or sporadic cases**. A mitigation approach therefore runs a high risk of leading to persistent transmission, necessitating endless cycles of lockdowns followed by a relaxation of restrictions—a pattern that cripples the economy, the health system and community engagement. In contrast, early preventive action to keep transmission under control not only prevents health system overload at every level of care—including care for diseases other than COVID-19—but also protects the physical and emotional health of citizens and health professionals, while also preserving social and economic life and increasing the trust and commitment of society as a whole ●

Figure 1. Examples of How Strategies Vary by Country.

- **South Korea, Taiwan, Singapore, Vietnam** and **New Zealand** have prioritised the containment and elimination of the novel coronavirus. Countries that previously experienced the Middle East respiratory syndrome **(MERS)** or severe acute respiratory syndrome **(SARS)** viruses have emphasised the importance of reducing the number of cases to zero.
- **Other countries**, viewing viral spread as inevitable, have sought to either mitigate the most acute and severe health impacts or allow controlled spread until some degree of herd immunity is achieved.

1. Conceptual and Temporal Framework: How We Talk About the Pandemic

"Concepts like syndemic and slow disaster are examples of alternative frameworks that can help us understand the pandemic and prevent infection."

The way in which a fact is presented and framed determines the actions taken in response to it and the parties called upon to act.[6]. Therefore, it is essential that we pay attention to the **metaphors and narratives** that help us make sense of the pandemic. Management of COVID-19 has thus far been characterised by objectives, indicators and expert knowledge, all laser-focused on mitigating or containing the health emergency. However, as the concept of a ***syndemic***[7] reminds us, **focusing excessively on the more clinical and biological features** of a disease can cause us to overlook **other aspects** such as social factors—particularly socioeconomic inequality—that are fundamental to understanding the pandemic and improving our management of it.

Similarly, treating the pandemic as a **health emergency** can situate us in a response framework that is too immediate and neglects the slower, more gradual effects, damage and impacts that arise from tolerating persistently high incidence rates. Examples include the increase in isolation and social inequality, the decrease in first oncology appointments and the "long COVID" syndromes found in some patients[8]. The concept of **slow disaster** might be useful here. Scientifically, this term refers to an atypical type of damage: more gradual, prolonged and silent than our traditional image of a disaster[9]. This concept can help us become better at recognising risk and understand certain logics and impacts of infection that are not readily visible or tangible.

Concepts like *syndemic* and *slow disaster* are examples of **alternative frameworks** that can help us understand the pandemic and prevent infection. They can also help us adjust our strategy, temporal framework and expectations to a **long, complex crisis** that, according to some models, could last two to five years[10].

[6] Shah S. It's Time to Tell a New Story About the Coronavirus—Our Lives Depend on It. *The Nation*. 14 July 2020.

[7] Horton R. Offline : COVID-19 is not a pandemic. *The Lancet*. 2020. 396(10255), 874.

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2. A Solid Detection and Control Infrastructure

"A well-sized, robust and coordinated public health infrastructure is essential to implementing a FTTIS strategy capable of achieving the goal of controlling and suppressing transmission of the virus."

A **well-sized, robust and coordinated public health infrastructure** is crucial to implementing a FTTIS strategy capable of achieving the goal of controlling and suppressing transmission of the virus. It is essential that epidemiological surveillance services have good leadership and the capacity to deliver an adequate response in coordination with health promotion and protection services. In terms of size, tools and coordination, the infrastructure must be capable of guaranteeing that the FTTIS strategy can be implemented **quickly, thoroughly** and with the necessary **support**.

1. **Speed** is the key to detecting cases and contacts, prescribing isolation and quarantine, and supporting people who need to isolate or quarantine themselves in order to interrupt chains of transmission. Speed is also a key factor in monitoring, evaluating and building trust in the public health strategy.

2. In order to perform **thorough contact tracing** (finding out where each person was infected and, therefore, where the virus is circulating), an infrastructure composed of IT/technology and human resources must collect information on the places visited by infected individuals and their contacts in order to group cases, suspected outbreaks and chains of transmission. Besides indicating that the epidemic is under control, thorough contact tracing helps the authorities make decisions regarding alert levels and other actions.

3. To ensure that people adhere to isolation and quarantine procedures, it is essential to provide effective, broad and diversified **support**—financial aid, housing assistance, social and psychological support, access to food and drugs, legal and employment advice, etc. Tools for systematically detecting support needs should be deployed in order to provide an adequate response and coordinate policies, services and personnel to guarantee good conditions for isolation and quarantine.

The infrastructure must be **large** enough to handle the workload and capable of adapting and **scaling** quickly as needs dictate. It is essential to have an across-the-board scaling programme for all human resources involved in the FTTIS system—from testing to tracing—in order to prevent the system from becoming overloaded. A **testing policy** should be established to assess and develop protocols for the various tests available, thereby optimising their utility. In order to develop this strategy, it is also necessary to encourage **teamwork**, communication among all parties involved, and a culture of review, **continuous evaluation** and adaptation to change.

Other crucial resources include a **centralised information system** that allows rapid, systematic and standardised data entry[11] or, failing that, a rapid information-sharing circuit to connect care providers and other key players and encourage collaboration between different jurisdictions. Tools such as a Bluetooth-based automatic contact detection application can be helpful, although they can never replace a solid public health infrastructure. Systems of this sort have been known to misidentify contacts. Moreover, they require a high level of acceptance. (Singapore, a model of success, has only managed to get 20% of the population to use its application.)

Equally necessary are **internal communication** tools to guarantee fluid contact between public health entities and other government bodies involved in the FTTIS strategy (ministries of health, social welfare, employment, economy, housing, etc.). Additionally, to the extent possible, **health care services** (primary care, hospitals, etc.) should be relieved of surveillance and diagnostic tasks in order to allow the health system to operate nor-

[11] Llupià A, Tusell M, Montañà J, Garcia-Basteiro A, Guinovart C. Improving Case and Contact Tracing During the COVID-19 Pandemic ISGlobal. Instalment #11 of the COVID-19 and response strategy series. 20 May 2020.

mally. To ensure that the entire system works as intended, **process and outcome indicators** *(see Table 1)* should be established to encourage teamwork, continuous training, analysis of systems, incident management and rigorous coordination ●

Tabla 1. Examples of FTTIS* Strategy Indicators and their Usefulness.

	Indicator(s)	Aspect(s) evaluated
Attribute		
Speed	Time elapsed between onset of symptoms, seeking of care, case confirmation, contact tracing and monitoring, and detection of support needs.	Quality of information flows, capacity to place all the necessary calls for each case, public trust in the system.
Thoroughness	Number of cases called/monitored out of the total number of new cases during a given period.	Capacity of tracing system.
	Number and percentage of cases linked to a known transmission chain during a given period.	State and level of transmission control.
Support for and enforcement of isolation and quarantine	Number and percentage of cases and contacts that complete quarantine or isolation out of the total number of new cases or contacts during a given period.	Capacity of the information and support system.
	Number and percentage of support queries resolved for cases and contacts, number of needs detected and covered.	Capacity to detect and address support needs.

Source: ISGlobal.

* Find, Test, Trace, Isolate and Support

3. An Alert-Level Plan

"In a maximum suppression strategy, stay-at-home orders are used during phases with a low number of cases. They are implemented briefly, in a targeted manner (only where necessary) and in coordination with other measures."

The strategy of maximum suppression must be accompanied by an **alert-level plan** devised with input from all sectors of society (**see examples from New Zealand and Ireland**[12,13,14]), in order to organise and regulate the various public health measures that must be implemented at different times during the epidemic. These measures include restrictions and, when necessary, stay-at-home orders *(see Figure 2)*, which must be accompanied by economic and social support to mitigate their consequences. The overall objective is to restore traceability and control, as well as to suppress transmission of the virus. Each alert level refers to a different set of population-level primary prevention measures, thus ensuring consistency in efforts to control and reduce viral spread.

Figure 2. Stay-at-home Orders As a Control Tool in Different Strategies.

- Stay-at-home orders have been shown to be effective at reducing transmission, albeit with significant economic and psychosocial consequences. In a **maximum suppression strategy**, stay-at-home orders are used during phases with a low number of cases to restore traceability and control. They are implemented briefly, in a targeted manner (only where necessary) and in coordination with other measures.
- In contrast, in **mitigation strategies**, stay-at-home orders are implemented later, during phases with very high rates of transmission, with the aim of preventing the health system from becoming overwhelmed. They therefore tend to be longer, more restrictive, and have a greater psychosocial and socioeconomic impact. The subsequent need to rapidly offset these impacts causes transmission rates to increase sharply once restrictions are lifted, thus increasing the likelihood of further stay-at-home orders and a loss of public trust in the effectiveness of the measures. If the authorities take too long to issue a stay-at-home order—and especially if such place and lifted too soon—transmission can become persistent, leading overall to a more severe impact on health, the economy and society.

Alert-level plans must be **inclusive and sensitive** to the rights and needs of citizens—especially the most vulnerable groups—and avoid discrimination on the basis of age, disability, gender, culture, socioeconomic status or institutionalisation, among other factors, while also anticipating other risks and emergencies that could interact with the pandemic (cold or heat waves, etc.).

Effective implementation requires that the plan be **public and widely agreed upon**. Knowledge of the different measures envisaged in the plan allows people to think ahead and prepare for alerts, which in turn fosters consistency, trust, credibility and community collaboration.

Local institutions also have a fundamental role to play in controlling the pandemic. Alert-level plans should therefore be accompanied by guidance on **best practices for local authorities**[15].

[12] COVID-19 alert levels plan of the Government of New Zealand.

[13] COVID-19 alert levels plan of the Government of Ireland.

[14] Graphic created by the Irish Times to illustrate Ireland's medium- and long-term plan to suppress the spread of the virus.

[15] Strengthening Preparedness for COVID-19 in Cities and Urban Settings: Interim Guidance for Local Authorities. World Health Organisation. 2020 (WHO/2019-nCoV/Urban_preparedness/2020.1).

Likewise, alert-level plans should be consistent with the principles and indicators for regulating **travel within the European Union**[16].

4. Communication Strategy

"The communication strategy must be capable of framing the zero-COVID objective as a matter of solidarity and constructive action, rather than as a question of individual safety (self-protection), obedience (compliance) or moral responsibility (good behaviour)."

Community involvement is essential to the success of a maximum suppression strategy. For this approach to be feasible, it is crucial to devise a communication strategy capable of generating safe spaces, solidarity and trust[17]. In other words, the communication strategy must be capable of framing the zero-COVID objective as a matter of solidarity and constructive action[18,19], rather than as a question of individual safety (self-protection), obedience (compliance) or moral responsibility (good behaviour). It is also important to communicate truthfully, rigorously, understandably and accessibly about risks. The messaging must be **credible, coherent, consistent over time and based on scientific evidence**, as well as sensitive to the needs of different groups and social situations.

Communications should also be **empowering**—that is, they should help people identify risks and make everyday decisions that lead to safer and more supportive environments, relationships and communities. For example, it is important to convey the importance of ventilating indoor spaces,[20], following the "social bubble" strategy[21] and avoiding crowded places[22]. The messaging should explicitly spell out the **epidemiological logic** behind the measures and recommendations. It is also essential to establish channels for listening, dialogue and public debate so that the epidemiological logic can be modulated and adapted to different groups and social situations.

The **data and indicators used to publicly monitor and assess the crisis** influence people's understanding of the conceptual and temporal framework of crisis management. It is therefore important to prioritise indicators and examples that tell a more coherent and consistent story about risks (e.g. describing outbreaks and percentages of linked cases, rather than hospital occupancy rates) and encourage citizens to do their part to control the spread of the virus.

[16] EU agrees common 'traffic light' system for coronavirus travel. Reuters. 9 October 2020.

[17] Yardley L, Amlot R, Rice C, Robin C, Michie S. How can we involve communities in managing the covid-19 pandemic? *BMJ Opinion*. 2020.

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[22] World Health Organisation infographic about the "Three Cs" strategy.

5. Knowledge and Debate

"This pandemic could be an opportunity to strengthen the relationship between science, politics and the public."

Finally, when implementing a strategy of minimising transmission, we believe it is crucial to **promote interdisciplinary, transdisciplinary and multidisciplinary research on the pandemic**. Thus far, in keeping with the health-emergency narrative, prioritisation and funding have primarily been directed towards strictly biomedical research, with little attention paid to epidemiological studies, which have essentially consisted of mathematical modelling. There are a number of essential impacts, factors and dynamics—psychological[23], social[24], economic, political[25], cultural[26], etc.—involved in reducing and preventing the spread of the virus that have not been widely studied thus far[27]. For example, few studies have investigated what sorts of social, geographical and economic conditions—or what places, groups and situations—encourage or discourage people from following public health measures[28]. Similarly, little research has looked into cultures or collective imaginations of risk, how they break down by social groups and how they shape people's involvement in FTTIS strategies[29]. Developing a **more plural and integrated body of knowledge and research** is essential to anticipating, tracing and interrupting chains of transmission as quickly as possible.

The need for a complex response to an equally complex problem must also be expressed in the arena of public debate. We therefore consider it important to encourage a **broader, more transparent and better informed debate about the pandemic**, raising the profile of other important angles, voices and sources of knowledge. This debate should encompass not only a broad range of expert knowledge but also the public at large. Informed by this exchange of ideas, we will be better equipped to adjust and improve the strategy of maximum suppression, making it more effective, comprehensive and widely shared. In short, this pandemic could be an opportunity to strengthen the relationship between science, politics and the public ●

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6. Conclusions

"Experiences at the international level suggest that countries pursuing a maximum suppression strategy develop a more effective epidemiological and community response with fewer negative economic and psychosocial consequences."

As the specialised literature shows, societies that learn and collaborate tend to emerge from major crises sooner and stronger[30]. Experiences at the international level suggest that countries pursuing a maximum suppression strategy develop a **more effective epidemiological and community response with fewer negative economic[31] and psychosocial consequences** than those which adopt a mitigation or herd-immunity strategy.

Although the maximum suppression strategy is challenging and demands a high degree of coordination and social involvement over an extended period of time, it is proving its value as a tool for **overcoming this crisis, preparing for future pandemics and fostering solidarity worldwide**.

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