

LONG-TERM PERSPECTIVES FOR A TOOL TO MONITOR RESPIRATORY INFECTIONS

THE RESPI RADAR

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CONTEXT

Since the early days of the COVID-19 pandemic, the RAG was asked to provide a system allowing for a simple interpretation of the epidemiological situation and for supporting the decision-making process. Several so-called management tools were therefore successively set up.

The last update of the COVID-19- management tool, at national and provincial levels, was done in December 2021. This tool was mainly based on indicators reflecting the COVID-19 related-pressure on the healthcare system (number of COVID-19 hospital admissions, COVID-19 ICU occupancy and number of consultations at GP practices for suspicion of COVID-19), supported by other indicators (positivity rate for symptomatic patients, Rt and 14-day incidence of cases). The tool distinguished three levels: Epidemiological situation under control (Level 1), Increasing viral circulation potentially leading to pressure on the health care system (Level 2), and High viral circulation with possible health care system overload (Level 3).

In the context of co-circulation of SARS-CoV-2 and other respiratory viruses, the RAG was asked in January 2023 to provide a management tool that would consider not only SARS-CoV-2 but also other respiratory viruses. The updated tool, validated in February 2023, included a new indicator (GP consultations for influenza-like illness - ILI), while the 14-day incidence of COVID-19 cases was removed. In March 2023, the RAG re-evaluated the management tool to better reflect the pressure experienced in the healthcare sector. Among other recommendations, this last update reviewed the weighing of the indicators by putting more importance on two indicators, “ICU occupancy” and “GP consultations for ILI”, to determine the management level.

The COVID-19 epidemic and its burden on the healthcare system continue to evolve. **There is a need to further reflect on the necessity of a broader, integrated and sustainable way of evaluating the epidemiological situation of respiratory infections in addition to the surveillance already being performed on a routine basis** (surveillance through sentinel networks of GPs, hospitals, nursing homes, as well as surveillance of wastewater). Hence, the

RAG held a workshop in June 2023 to discuss the long-term perspectives of a (management) tool. Two key questions were addressed:

- 1- Is there a need for a tool? If yes, what would be the objective of such a tool, its added value, target public or scope?
- 2- Is it feasible to have a tool? What data would be available to feed the tool, or what would be its frequency/seasonality?

RECOMMENDATIONS

1. The RAG recommends implementing the “**Respi-Radar**” tool.
2. The **purpose** of the “Respi-Radar” is to assess the severity of the epidemiological situation of respiratory infections and to inform public health preparedness and response. Hence, its **scope** includes all respiratory infections, and not only COVID-19.
3. The “Respi-Radar” should not be used permanently but only when an early signal is detected within the respiratory infections surveillance, which is carried out all year round by Sciensano (surveillance data from GP practices, hospitals, nursing homes, wastewater, genomic surveillance). Once a specific signal is detected, the tool will be (re) implemented and a RAG evaluation, based on a quantitative and qualitative assessment, will be carried out regularly. Hence the “Respi-Radar” **frequency** may vary during the year, depending on the epidemiological situation of the respiratory infections.
4. The “Respi-Radar” will be **aimed primarily at the health authorities (represented in the RMG)** to provide an overview of the trends and the severity of the epidemiological situation. Moreover, it will also serve as a communication tool to the **healthcare sector** (first and second line).
5. The “Respi-Radar” will be divided into 3 levels:
 - Yellow: The epidemic threshold has been reached but the situation remains under control. There is a low viral circulation but the activity and the impact on the healthcare system (first and second line) remains limited. Measures to increase surveillance might be needed.
 - Orange: Moderate viral circulation with pressure on the healthcare system; public health measures are necessary to reverse the trend.
 - Red: Important or very important viral circulation with a high risk of overwhelming of the healthcare system. Measures to mitigate the epidemic might be needed.The “green situation” is considered as the baseline situation (pre-epidemic) when the tool is not necessary/in use, i.e. when the epidemiological situation does not require any specific evaluation.
6. The “Respi-Radar” will be based on indicators from the ILI and SARI surveillances, as well as the wastewater surveillance. Additional indicators will feed the assessment of the situation, including data from the genomic surveillance or all-cause mortality.

“Respi Radar” tool:

Level	GP consultation for ILI*	GP consultation for ARI*	ILI in nursing homes**	Hospitalizations for SARI*	Severity SARI [§]	Wastewater ^{§§}
Yellow	128-507	1208-1293	7-13	4,4-9,8	0,68 - 1,4	5 – 10 stations +
Orange	508-783	1294-1984	14-20	9,9-33,7	1,41 - 3,03	11-15 stations +
Red	>783	>1984	>20	>33,7	> 3,03	> 15 stations +

* Incidence per 100 000 inhabitants

** Incidence per 1000 nursing home residents

§ Severity SARI indicator: incidence per 100 000 inhabitants that present at least one of the following during hospital stay: ARDS, ECMO, invasive ventilation, ICU stay or death

§§ Wastewater indicator: number of stations positive for the “high circulation” indicator

- Public health measures or actions linked to each level will be proposed in accordance with existing guidelines provided by the CSS/HGR or other advisory bodies (SSC, RAG).

DISCUSSION

- As the COVID-19 epidemiological situation further evolves and because of the need to consider SARS-CoV-2 as any other respiratory infection, the COVID-19 surveillance will be integrated within the routine respiratory infections’ surveillance.
- As the tool will enable an assessment of the severity of the epidemiological situation of respiratory infections during specific/defined time periods, the RAG proposes to change its name to “Respi-Radar”.
- Having a tool guiding actions linked to the epidemiological situation is estimated important for respiratory diseases given their potential to easily spread within the population, cause severe infections and put a burden on the health care system. A tool for other pathogens (gastro-intestinal for instance) was discussed but not retained for now.
- The tool will not be used on a permanent basis but only when a specific signal is detected or a specific threshold reached among one of the indicators of the respiratory infections surveillance. The tool will then be (re)implemented, to ensure an evaluation of the severity of the epidemic/pandemic by the experts of the RAG. Early warnings will be detected through the existing routine surveillance systems for respiratory infections – including the sentinel networks of general practitioners, of hospitals and of nursing homes, the general practitioners involved in the barometer, the wastewater surveillance, the genomic surveillance for COVID-19, the excess mortality as well as the event-based surveillance and international signals, which all are systems carried out on a permanent basis. On the other hand, some systems that were in place for the surveillance of COVID-19 will no longer be maintained, such as the surge capacity survey in hospitals.
- An early warning could include both seasonal or non-seasonal unexpected events. The RAG will meet to evaluate the epidemiological situation when:
 - The criteria of the **algorithm** are met:
 - If ≥ 4 indicators are at least in yellow OR ≥ 2 in orange OR ≥ 1 in red (based on the 6 indicators of the Respi-Radar tool)

- When there is a **specific/worrisome signal** detected within the routine respiratory surveillance, WGS or international signals

Then, a **RAG evaluation**, based on a discussion about the different indicators, will be carried out to **determine** the national epidemiological level.

- The “Respi Radar” includes various indicators from the respiratory infections surveillance with the objective to gather information on viruses circulation, severity of the diseases and their impact. These indicators include GPs consultations for ILI, GPs consultations for ARI, Hospitalizations for SARI and ILI in nursing homes. For the first three, specific thresholds have been calculated using the Moving Epidemic Method (MEM). Thresholds for the ILI in nursing homes indicator or wastewater have been defined by expert consensus.
- Other indicators, without specific thresholds, will also contribute to the assessment, in a qualitative manner, such as the COVID-19 genomic surveillance, infectieradar, modelling results or results from the sentinel laboratories. New data sources might also become available in the future and included in the assessment.
- The RAG will also determine when to return to the baseline level. Having different thresholds/indicators for ascending or descending phases of an epidemic was also discussed, but it was proposed to keep the same system in both ascending and descending phases. However as the evaluation always includes a qualitative assessment, different indicators with different relevance and different evolution depending on the epidemic phase might be taken into account.
- The “Respi Radar” should contribute to ensuring protection of the healthcare system by avoiding excessive pressure on it. It is primarily aimed for the health authorities, in order for them to have an accurate view on the severity of the epidemiological situation and, eventually, implement public health measures.
- It will also provide a way to communicate on the situation to the healthcare sector. Although not a primary objective, the Respi Radar might be used as a tool for communicating to the general population to enable them to take the most appropriate decision, depending on their condition (e.g. vulnerable people).
- Depending on the epidemiological evaluation made by the RAG, recommendations to inform public health response will be provided, such as the upscaling of surveillance systems (e.g. contact tracing, hospital capacity) or the implementation of public health measures (e.g. mask wearing, containment measures). Such measures will be proposed based on advices provided by other consultative bodies (see for instance the advice of the CSS/HGR on mask wearing per epidemic phase).

BACKGROUND INFORMATION:

- In 2017, WHO, together with member states, developed a guide to assess the severity of influenza in seasonal epidemics and pandemics (Pandemic Influenza Severity Assessment (PISA))¹. The aim of such assessment was to (i) describe the epidemiological situation and assess the severity of an influenza epidemic, (ii) inform national and global risk assessment and (iii) inform public health preparedness, response and recovery measures. Influenza

¹ <https://apps.who.int/iris/bitstream/handle/10665/259392/WHO-WHE-IHM-GIP-2017.2-eng.pdf>

(pandemic) severity was defined in terms of three indicators: transmissibility of an influenza virus, seriousness of influenza disease and impact. Severity indicators were chosen by each country, for each indicators thresholds were set and used to assess severity. Severity assessment findings were then reported to WHO. There are currently discussions to expand the PISA indicators to respiratory diseases in general, not only Influenza. The objectives of Respi-Radar are in line with those of PISA.

- The MEM method is a statistical methodology that uses time series from previous epidemics (up to 5 five years) to properly define thresholds to determine the level of activity of the pandemic, on a weekly basis. This method was first designed for influenza but has been tested for different respiratory infectious diseases and is now used for different respiratory infections². The MEM method was used to define thresholds for the following indicators: GP consultations for ILI, GP consultations for ARI, hospitalizations for SARI.
- Information on practices regarding the use of a management tool in other countries has been collected through the PHIRI (Population Health Information Research Infrastructure) portal from 14 countries. Almost all countries did use a management tool during the COVID-19 pandemic, except Sweden, Croatia and Romania. Norway and Germany did not use a specific tool per se but various indicators/tools/thresholds to monitor the impact of the pandemic.
 - For almost all countries that used a management tool, thresholds and/or levels were used to implement public health measures. Exception was Austria that took the risk assessment into account but was never directly linked to policy measures.
 - Currently, in most of the countries that used a management tool, the tool is not applicable anymore. Exceptions are Austria (suspension by the end of June 2023) and Bulgaria where the risk assessment tool is still active and updated regularly. However, most countries continue to monitor COVID-19 and provide reports/dashboard.
 - Few countries include the COVID-19 surveillance within the respiratory virus's surveillance (UK, Norway). The other countries still have a specific COVID-19 surveillance.

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² <https://pubmed.ncbi.nlm.nih.gov/22897919/>

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