

International Horizon Scanning and Learning to Inform Wales' COVID-19 Public Health Response and Recovery

Report 12, 23/07/2020



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Overview

The International Horizon Scanning and Learning work stream was initiated following and informing the evolving coronavirus (COVID-19) public health response and recovery plans in Wales. It focuses on COVID-19 international evidence, experience, measures, transition and recovery approaches, to understand and explore solutions for addressing the on-going and emerging health, wellbeing, social and economic impacts (potential harms and benefits).

The learning and intelligence is summarised in weekly reports to inform decision-making. These may vary in focus and scope, depending on the evolving COVID-19 situation and public health / policy needs.

This work is aligned with and feeding into the Welsh Government Office for Science and into Public Health Wales Gold Command. It is part of a wider Public Health Wales' systematic approach to intelligence gathering to inform comprehensive, coherent, inclusive and evidence-informed policy action, which supports the Wellbeing of Future Generations (Wales) Act and the Prosperity for All national strategy towards a healthier, more equal, resilient, prosperous and globally responsible Wales.

Disclaimer: The reports provide high-level summary of emerging evidence from country experience and epidemiology; research papers (peer-reviewed/not); and key organisations' guidance / reports, including sources of information to allow further exploration. The reports don't provide detailed or in-depth data/evidence analysis. Due to the novelty of COVID-19 virus/disease, and dynamic change in situation, studies and evidence can be conflicting, inconclusive or depending on country/other context.

In focus this week

-  **Vitamin D**
-  **Influenza rates and COVID-19**
-  **COVID-19 risk communication**

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At a glance: summary of international learning on COVID-19

“With strong leadership, community engagement, and a comprehensive strategy to suppress transmission and save lives, COVID-19 can be stopped.”

Dr Tedros Adhanom Ghebreyesus, WHO Director-General

Vitamin D

- ✚ Vitamin D **boosts the immune system and helps fight off infections**
- ✚ Vitamin D **deficiency may contribute to increased risk of respiratory tract infections**
- ✚ Currently, there is **no conclusive evidence** that taking **vitamin D supplements specifically assists in the prevention or treatment COVID-19**
- ✚ Global COVID-19 data shows a **correlation between severe vitamin D deficiency and mortality rates from COVID 19**, related to hyperactive immune response
- ✚ **Further research is necessary** to fully reveal the mechanisms of vitamin D effects, especially in case of COVID-19
- ✚ In the UK, vitamin D deficiency is common among all ethnicities, especially during winter, but **BAME communities are particularly at risk**
- ✚ **High risk groups** for vitamin D deficiency include darker-skinned people, young children, adolescents, pregnant women, older people (especially the institutionalized) and non-Western immigrants; lower levels can be found in people who avoid sun exposure during summer, vegetarians or vegans, those who are overweight, obese or smokers
- ✚ **Excessive vitamin D intake can be harmful**, though toxicity is not common and occurs almost exclusively in people, taking long-term, high-dose supplements without monitoring
- ✚ All people should continue to **follow UK Government advice on daily vitamin D supplementation** to maintain bone and muscle health during the COVID-19 pandemic
- ✚ Taking a daily supplement (400 IU/day (10 µg/day)) and eating foods that provide vitamin D is particularly **important for those self-isolating with limited exposure to sunlight**
- ✚ The most effective public health strategy to increase Vitamin D levels across the population is **food fortification**, followed by **taking vitamin D supplements**; and lastly improving **intake of vitamin D-rich foods**
- **Phototherapy** can help stimulate the production of vitamin D more effectively than taking supplements; and has the **potential to reduce the impact of coronavirus diseases**

More information is summarised **on pp. 5-10**

Influenza rates and COVID-19

- ✚ 2020 statistics for influenza/influenza-like illness activity in Australia and New Zealand shows **significantly lower rates, compared to previous years (five year average)**
- ✚ Currently, **existing data is inconclusive** to whether the decrease in influenza cases in Australia and New Zealand is associated with the public health measures implemented to mitigate the risk of COVID-19
- ✚ **Other factors**, which could have influenced the spread of influenza include:
 - ✓ **Overburdened health care and surveillance systems**, focusing testing capacity on COVID-19 rather than seasonal influenza
 - ✓ Increased resources and capacities to **start annual influenza immunisation programmes earlier**; and increased uptake of vaccinations compared to previous years

More information is summarised **on pp. 11-14**

COVID-19 risk communication

- ✚ **Scientifically sound risk communication** requires explicit analysis of the decisions facing people; empirical assessment of relevant beliefs, values and decision-making processes; and development and evaluation of messages, focusing on critical facts to individuals' choices
- ✚ **WHO best practice of risk communication** highlights **eight key points**:
 - ✓ Create and maintain trust
 - ✓ Acknowledge and communicate even in uncertainty
 - ✓ Coordinate
 - ✓ Be transparent and fast with the first and all communications
 - ✓ Be proactive in public communication
 - ✓ Involve and engage those affected
 - ✓ Use integrated approaches
 - ✓ Build national capacity, support national ownership
- ✚ **Public education campaigns** should be grounded in the science of risk communication, as the acceptability of health measures is vital to community adherence
- ✚ **Key predictors of adherence to / compliance with measures**, include: levels of perceived susceptibility to, severity of and risk from the disease; belief in the effectiveness of the recommended behaviours; levels of anxiety, fear and trust in authorities
- ✚ **Inequalities in access to resources** can affect the ability to comply with recommended measures
- ✚ **Information disseminated** should be accurate, clear, uncomplicated, not sensationalistic or alarmist, and as reassuring as possible
- ✚ **'Optimism bias'** is the belief that bad things are less likely to happen to oneself, useful for avoiding negative emotions, but also underestimating risk and reducing compliance
- ✚ **Communication strategies must strike a balance** between breaking through optimism bias without inducing excessive feelings of anxiety and fear
- ✚ **Failures in risk communication** can instigate public fear, mistrust, lower adherence to public health measures and civil unrest

More information is summarised **on pp. 15-21**

Vitamin D

Role of Vitamin D in the prevention of infectious diseases¹²³⁴⁵⁶⁷⁸⁹¹⁰

- Vitamin D deficiency often occurs in winter months, due to decreased exposure to sunlight
- There is evidence that vitamin D boosts the immune system and helps fight off infections
- Vitamin D deficiency may contribute to increased risk of influenza and other respiratory tract infections
- Experimental evidence supports the hypothesis that vitamin D has direct anti-viral effects, particularly against enveloped viruses
- Existing evidence do not completely model the complex effects of vitamin D and may not accurately represent its systemic influence
- Vitamin D deficiency can be easily assessed and rapidly managed through supplementation
- Assessing the actual prevalence among different cohorts and the efficacy of supplementation remains a focus of clinical studies
- In the absence of evidence from Randomised Control Trials (RCTs), numerous epidemiological studies suggest that a vitamin D serum concentration of 75 nmol/L (30 ng/mL) and above may reduce the risk of common cancers, autoimmune diseases, type 2 diabetes, cardiovascular and infectious diseases. These underlying conditions, together with the often concomitant vitamin D deficiency, increase the risk of severe COVID-19 outcomes
- The hypothesis, that there is an association between seasonal upper respiratory tract infections (seasonality of influenza) and vitamin D deficiency (as both occur in the winter months) remains controversial
- Global data from the COVID-19 pandemic (including 10 countries) has shown a strong correlation between severe vitamin D deficiency and mortality rates, related to hyperactive immune system. Vitamin D strengthens innate immunity and prevents overactive immune response. This could explain 'mysteries', including why children may die from COVID-19
- Currently, there is no conclusive evidence that taking vitamin D supplements specifically assists in the prevention or treatment COVID-19
- Further experiments are necessary to fully reveal the mechanisms of vitamin D effects, especially in case of COVID-19

UK Government advice on vitamin D supplementation¹¹¹²

- All people should continue to take daily vitamin D supplementation to maintain bone and muscle health during the COVID-19 pandemic (not only in the autumn/winter)
- Taking a daily supplement (400 IU/day (10 µg/day) in the UK) and eating foods that provide vitamin D is particularly important for those self-isolating with limited exposure to sunlight

¹ <https://eje.bioscientifica.com/view/journals/eje/180/4/EJE-18-0736.xml>

² <https://nutrition.bmj.com/content/early/2020/05/15/bmjnph-2020-000089>

³ <https://www.sciencedaily.com/releases/2020/05/20200507121353.htm>

⁴ <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3308600/>

⁵ <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6121423/>

⁶ <https://www.nice.org.uk/advice/es28/chapter/Advisory-statement-on-likely-place-in-therapy>

⁷ <https://royalsociety.org/-/media/policy/projects/set-c/set-c-vitamin-d-and-covid-19.pdf>

⁸ <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4708965/>

⁹ <https://www.mdpi.com/2072-6643/12/4/988/htm>

¹⁰ <https://www.nice.org.uk/advice/es28/evidence/evidence-review-pdf-8777674477>

¹¹ <https://nutrition.bmj.com/content/early/2020/05/15/bmjnph-2020-000089>

¹² <https://www.nhs.uk/conditions/vitamins-and-minerals/vitamin-d/>

- Other countries differ in their advice, for example, the US recommends 15 µg/day for those under 70 years old, and 20 µg/day for the over 70s

Risks associated with high vitamin D intake¹³¹⁴¹⁵

- Vitamin D supplements should be taken with caution, as **excessive intake (more than 100 µg/day) over a long period of time can be harmful**
- Toxicity is not common and occurs almost exclusively in people who take long-term, high-dose supplements without monitoring, causing excessive build-up in the human body
- **Vitamin D intoxication occurs when blood levels rise above 150 ng/ml (375 nmol/l)**
- Main potential effects of high doses of vitamin D include:
 - ✓ **Elevated blood calcium levels**, that can cause unpleasant and potentially dangerous symptoms, such as nausea, vomiting, poor appetite, stomach pain, constipation or diarrhoea
 - ✓ **Bone loss**: although vitamin D is required for calcium absorption, high levels may cause bone loss by interfering with vitamin K activity
 - ✓ **Kidney injury or failure** in people with healthy kidneys and those with kidney disease

Ethnicity and vitamin D deficiency¹⁶¹⁷¹⁸¹⁹²⁰²¹²²²³²⁴

- Vitamin D deficiency is common in Europe and the Middle East. It occurs in <20% of the population in Northern Europe, in 30–60% in Western, Southern and Eastern Europe and up to 80% in Middle Eastern countries
- People with skin containing more melanin pigment require up to 10 times more sunlight exposure to produce the same amount of vitamin D as people with paler skin
- It is unclear if low vitamin D levels in people with darker skin is due to skin pigmentation, physiological differences or factors, such as, diet, custom, dress, socioeconomic conditions
- **Socioeconomic conditions** are a contributing factor with ethnic groups more likely to live in more polluted and deprived areas - recent studies show an increased risk of influenza for people living in areas with high levels of air pollution
- In some high latitude countries, such as the UK, vitamin D deficiency is common among all ethnicities, especially during winter, but **BAME communities are particularly at risk**:
 - ✓ A UK study found that Asian people are vitamin D deficient all year round
 - ✓ A study found that Asian women have lower levels of vitamin D than Asian men; the same gender differences are not apparent in Europeans or Afro-Caribbean's
 - ✓ A UK study found consistently low levels of vitamin D in South Asian volunteers, as compared with White Caucasians, with all levels declining in the winter (*Figure 1*)
- A meta-analysis looking at the vitamin D status of **African populations** found that:
 - ✓ In Africa, women, new-borns and urban populations have the lowest vitamin D levels

¹³ <https://www.mayoclinic.org/healthy-lifestyle/nutrition-and-healthy-eating/expert-answers/vitamin-d-toxicity/faq-20058108>

¹⁴ <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4708965/>

¹⁵ <https://www.healthline.com/nutrition/vitamin-d-side-effects#2>

¹⁶ <https://eje.bioscientifica.com/view/journals/eje/180/4/EJE-18-0736.xml>

¹⁷ <https://www.cambridge.org/core/journals/proceedings-of-the-nutrition-society/article/vitamin-d-deficiency-in-western-dwelling-south-asian-populations-an-unrecognised-epidemic/CE588A6D63D0113233A0FFED4D8C20F8>

¹⁸ <https://www.bmj.com/content/369/bmj.m1548/rr-6>

¹⁹ <https://www.sochealth.co.uk/wp-content/uploads/2020/06/Scientists-for-Labour-BAME-Covid-19.pdf>

²⁰ <https://www.thelancet.com/journals/langlo/article/PIIS2214-109X%2819%2930457-7/fulltext>

²¹ Gois P, Ferreira D, Olenski S, Seguro A. Vitamin D and infectious diseases: Simple bystander or contributing factor? *Nutrients*. 2017;9(7):651

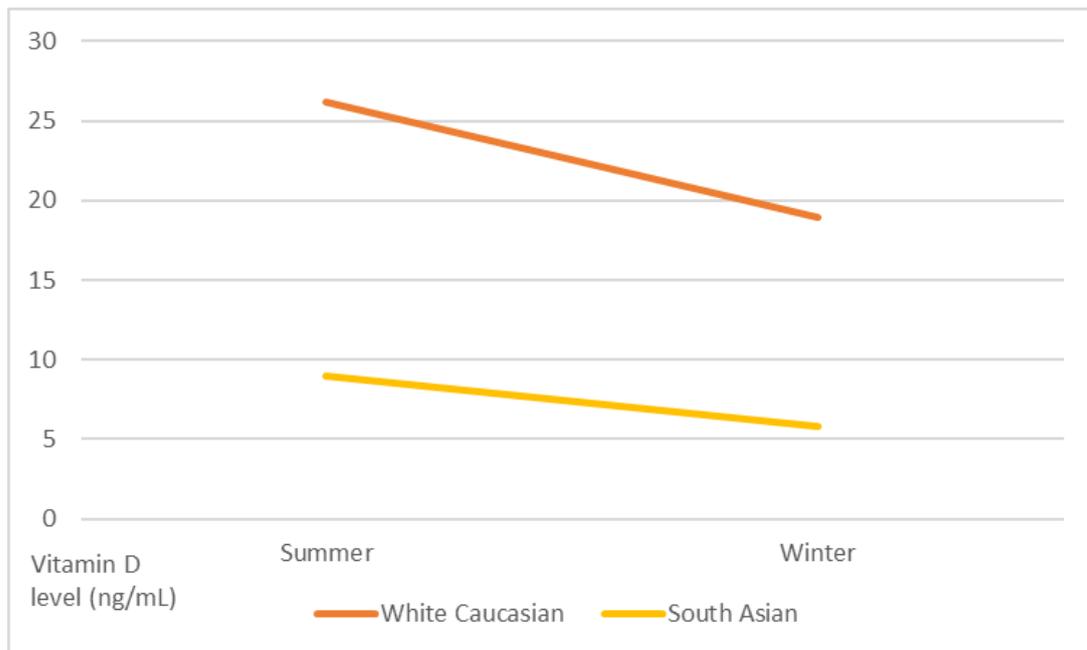
²² https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/537616/SACN_Vitamin_D_and_Health_report.pdf

²³ <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC462271/>

²⁴ <https://www.mdpi.com/2072-6643/12/4/988/htm>

- ✓ People practicing traditional lifestyles have the highest vitamin D levels
- ✓ People of African ancestry living in temperate regions are more likely to have low vitamin D levels, compared to other ethnicities in the same setting, e.g. in the US, the prevalence among African-Americans is 82.1%, compared to the national average of 41.9%

Figure 1. Vitamin D in South Asian volunteers and White Caucasians in Manchester



Public health strategies to increase vitamin D intake²⁵²⁶²⁷

- **Vitamin D fortification (mandatory or voluntarily) of food** represents the **best opportunity to increase vitamin D** supply to the population
- **Improving intake of naturally occurring vitamin D-rich foods is the least effective** strategy, due to very few food sources that are rich in vitamin D (such as oily fish); usually with limited availability; and not frequently consumed by many people
- **Vitamin D supplements can significantly improve vitamin D intake** across a variety of age, race, ethnic and gender groups as well as improving vitamin D levels.
 - ✓ Population intake of vitamin D from supplements is **quite low**, mainly due to the relatively low vitamin D content of most supplements, compared to the recommended
 - ✓ Supplements can be **dosed daily, weekly, monthly and with larger intervals up to one year**, with different effectiveness to increase vitamin D blood levels:
 - a) Comparing daily, weekly and monthly doses, show similar vitamin D blood levels in one study (after 2 months); and similar increase of vitamin D with daily or weekly doses, but less effective monthly doses in a nursing home study
 - b) Yearly dose of vitamin D has not shown to be effective in UK and Australian studies

²⁵ <https://eje.bioscientifica.com/view/journals/eje/180/4/EJE-18-0736.xml>

²⁶ <https://journals.sagepub.com/doi/abs/10.1177/1403494819896878>

²⁷ <https://nutrition.bmj.com/content/early/2020/05/15/bmjnph-2020-000089>

Sunlight exposure²⁸²⁹³⁰³¹ and Seasonal Affective Disorder (SAD) lamps

- Recommendations on limiting summer sunlight exposure to prevent skin cancer may conflict with requirements to protect bone health and strengthen immune system through adequate vitamin D levels (the principal source being UVB in summer sunlight)
- Many studies show that the body is most efficient at producing vitamin D at noon, so getting **vitamin D (sun exposure) around midday** is more efficient. This might be also safer than getting sun later in the day, as studies have found that afternoon sun exposure may increase the risk of dangerous skin cancers
- In the UK, 13 minutes of midday sunlight exposure during summer, three times per week, is enough to maintain healthy levels among Caucasian adults
- Studies estimate that darker-skinned people may need anywhere from 30 minutes to three hours longer to get sufficient vitamin D, compared to lighter-skinned people. This is a major reason why darker-skinned people have a higher risk of deficiency
- Phototherapy / light therapy can help stimulate the production of vitamin D3 and can be more effective than taking supplements

Use of SAD lamps to increase resistance to viral infections³²³³³⁴³⁵³⁶³⁷³⁸

- Evidence suggests that phototherapy has the **potential to significantly reduce the impact of coronavirus diseases**:
 - ✓ **Light in the blue range** has antimicrobial properties and can inactivate the common flu; and could potentially reduce the likelihood of developing bacterial infections associated with COVID-19
 - ✓ **Red and near infrared light** could potentially reduce acute respiratory disorder syndrome in Covid-19 patients by reducing lung inflammation and fibrosis
- During the 2018 H1N1 flu pandemic, recovery rates were higher in patients treated with sunlight / heliotherapy, reducing mortality and also helping to prevent infections among healthcare workers
- A recent study found that participants exposed to a phototherapy kiosk once every other week recorded higher levels of vitamin D3 than those taking daily supplements for 10 weeks. No differences were observed in race / ethnicity or skin type
- The pros and cons of using SAD lamps are highlighted in *Table 1*

²⁸ <https://pubmed.ncbi.nlm.nih.gov/24494046/>

²⁹ <https://pubmed.ncbi.nlm.nih.gov/20072137/>

³⁰ <https://pubmed.ncbi.nlm.nih.gov/18348449/>

³¹ <https://pubmed.ncbi.nlm.nih.gov/29124692/>

³² <https://www.sciencedirect.com/science/article/pii/S1011134420303419>

³³ <https://www.mayoclinic.org/tests-procedures/light-therapy/about/pac-20384604>

³⁴ <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2846322/>

³⁵ <https://www.sciencedaily.com/releases/2017/09/170913193101.htm>

³⁶ <https://emedicine.medscape.com/article/128762-overview#a1>

³⁷ <https://pubmed.ncbi.nlm.nih.gov/24494042/>

³⁸ https://academic.oup.com/cdn/article/4/Supplement_2/240/5844772

Table 1. Advantages and disadvantages of SAD lamps

Advantages	Disadvantages
Generally safe and widely available	<ul style="list-style-type: none"> - Some people may experience mild and short-lasting symptoms, such as headaches, eyestrain, nausea and irritability - They may not be suitable for people with certain skin and eye conditions, people taking medications that increase light sensitivity or people diagnosed with bi-polar disorder
They can be placed on a desk while working	Using a SAD lamp or light box involves sitting in close proximity for up to an hour every day
A lamp emitting UV light can be used to stimulate vitamin D3 production in the skin during the winter months	<ul style="list-style-type: none"> - UV radiation can cause damage to the eyes and skin and increase the risk of skin cancer. - In a clinical context, evidence suggests that using a UV LED on areas less exposed to the sun can help minimise this risk

Country examples

Vitamin D deficiency in Europe³⁹⁴⁰⁴¹⁴²

- Vitamin D deficiency **risk groups** include young children, adolescents, pregnant women, older people (especially the institutionalized) and non-Western immigrants
- Other groups, **more likely to have low vitamin D levels**, include those who avoid sun exposure during summer, vegetarians/vegans, those who are overweight, obese or smokers
- In Scandinavia only 5% of the population is affected by vitamin D deficiency, following focused food fortification strategies
- In Germany, France and Italy more than 25% is affected, particularly older people
- In Austria up to 90% of senior citizens have low vitamin D levels
- UK national surveys show approximately 1 in 5 people (20%) to have low vitamin D levels
- Severe deficiency (serum 25(OH) <30 nmol/L or 12 ng/mL) is found in >10% of Europeans
- The European Calcified Tissue Society (ECTS) advises that the measurement of serum vitamin D (25(OH)D) should be standardized by a Vitamin D Standardization Program

Vitamin D supplements strategies across countries

- The approach toward vitamin D supplementation varies across countries (*Table 2*)
- The mean vitamin D intake in most European countries, except the Nordic countries, is well below the minimal requirement to achieve the threshold of 50 nmol/L 25(OH)D, unless there is regular access to sunlight or supplementation, including cod liver oil
- Depending on the lifestyle and nutritional habits, the required vitamin D supplementation may vary for different segments of the population and for different countries. For example:
 - ✓ In Norway, vitamin D status is adequate in a large part of the population, due to sun exposure on a skin with little pigment, high consumption of fish and cod liver oil and adequate dietary calcium intake

³⁹ <https://eje.bioscientifica.com/view/journals/eje/180/4/EJE-18-0736.xml>

⁴⁰ <https://www.sciencedirect.com/science/article/pii/S2352364620300067?via%3Dihub>

⁴¹ shorturl.at/boAGM

⁴² <https://journals.sagepub.com/doi/abs/10.1177/1403494819896878>

- ✓ In contrast, vitamin D status in Southern Italy may be poor due to low sun exposure on a more pigmented skin, little access to vitamin D-rich food (oily fish or cod liver oil), and a low dietary calcium intake

Table 2: An overview of vitamin D supplementation policies / interventions in different countries

Country	Vitamin D policies / interventions
Denmark	<ul style="list-style-type: none"> - The Danish Veterinary and Food Administration has generally accepted addition of vitamin D to certain products, including fat spreads, sports drinks and lactose-free milk products - In addition, Vitamin D fortification of foods needs to be approved by the Danish Veterinary and Food Administration before placed on the Danish market. The approval is based on an individual risk assessment carried out on a case-by-case basis by the National Food Institute
Finland	<ul style="list-style-type: none"> - Focus on improving vitamin D status in the whole population by extensive fortification - In 2010, The National Nutrition Council launched new fortification recommendations: 1.0 µg/100 g (40 IU/100 g) for all fluid milk products; and 20 µg/100 g (800 IU/100 g) for spreadable fats - The dairy industry responded immediately and almost all fluid milk products were fortified, with the exception of ecological products - This has had positive impact on the vitamin D intake and levels in adults, whose mean vitamin D intake now is about 10 µg where close to 40–50% comes from fortified milk products. - Studies have shown that less than 6% of the Finish population has a vitamin D concentration lower than 50 nmol/L in the autumn/winter months in 2011, compared to 2000, when about 50% had concentrations lower than 50 nmol/L. The prevalence of severe vitamin D deficiency (<30 nmol/L) decreased from 13% to 0.6% over the 11 year period
Iceland	<ul style="list-style-type: none"> - Some imported foods are fortified with vitamin D, for example, some vegetable oils and cereals - Domestic production is not subjected to mandatory fortification and is not universal, but most fat spreads and some types of fluid milk (albeit with a minor market share) are fortified with vitamin D
The Netherlands	<p>The advice to take vitamin D drops 10 µg/day (400 IU/day) in infants and children below 4 years of age is common practice, provided by special children consultation clinics visited by great majority of young children</p>
Norway	<ul style="list-style-type: none"> - Foods, such as butter, margarine and some types of low-fat milk are voluntarily fortified with vitamin D, but with lower amounts than in Finland and Sweden. - A recent report by the Norwegian National Nutrition Council recommends changes in the vitamin D fortification policy: <ul style="list-style-type: none"> ✓ To reach high-risk groups, fortification should cover a wider range of products with moderate vitamin D concentrations rather than a few products with high concentration ✓ Specifically, fortification should be extended to all fluid milk products and vegetable based alternatives and maintained in butter and margarine ✓ Fortification of juice, bread and cooking oils should be considered
Sweden	<ul style="list-style-type: none"> - Low-fat milks and solid margarines are mandatorily fortified with vitamin D - From 2018 the fortification policy included a wider range of products - All milk with fat < 3% and sour milk products, lactose-free products, vegetable-based alternatives and fluid margarines are recommended to be fortified
Turkey	<p>Free distribution of vitamin D drops to all new-born infants visiting primary care facilities has decreased the prevalence of rickets from 6% in 1998 to 0.1% in 2008 in children under 3 years of age</p>
US and Canada	<ul style="list-style-type: none"> - Fortification of foods has an important effect on the mean daily intake of vitamin D by the average adult, but it does not yet reach the required levels of vitamin D intake - This may relate to the level of fortification, types and choice of food and the issue of mandatory or optional/voluntary fortification

Influenza rates and COVID-19

Overview

- Public health measures to prevent, reduce and manage COVID-19⁴³⁴⁴ spread and risks, have been implemented across the world, which could have also led to decrease in seasonal influenza incidence
- Given the impacts of COVID-19, the current global influenza data must be interpreted with caution
- Conclusions should be made carefully, as the reduced number of influenza cases may be also due to a decrease in testing for and overburdened surveillance systems⁴⁵⁴⁶⁴⁷
- Combined, pressures from influenza outbreaks and the COVID-19 pandemic have the potential to challenge and overburden healthcare systems worldwide⁴⁸⁴⁹
- Patterns and measures, taken in southern hemisphere countries (currently in 'influenza season'), can inform approaches in northern hemisphere countries

Country example: New Zealand⁵⁰⁵¹⁵²⁵³

- The Annual Influenza Immunisation Programme usually starts on the 1st of April
- This year, the programme **started two weeks earlier** to protect the most vulnerable and those most at risk, including health care and emergency response workers
- Flu immunisation was provided for **children aged 6 to 35 months** from 1st of April as usual; and **other essential workers** from 22nd of April
- Vaccination uptake has been higher this year

Epidemiological data⁵⁴

- Influenza intelligence reports for 2020 are not available yet, but online dashboards are showing latest statistics
- FluTracking is an online surveillance system, used to detect the spread of influenza
- The number of patients with influenza-like illness symptoms captured by the FluTracking is lower than in 2018 and 2019
- Hospitalisation rates for Severe Acute Respiratory Infection (SARI) in 2020 are considerably lower, compared with historical data. Increased hospitalisation rates from mid-June 2020 onwards observed (*Figure 2*)
- Hospitalisation rates for Influenza Positive SARI for 2020 are currently lower, compared to historical rates with reported rate 0 per 100,000 since April 2020 (*Figure 3*)
- Influenza-like illness activity is low, compared to 2018 and 2019, with similar pattern observed for SARI weekly rates, i.e. an increase from mid-June 2020 onwards (*Figure 4*)

⁴³ <https://www.ecdc.europa.eu/sites/default/files/documents/covid-19-social-distancing-measuresq-guide-second-update.pdf>

⁴⁴ <https://apps.who.int/iris/rest/bitstreams/1278127/retrieve>

⁴⁵ <https://www.thelancet.com/action/showPdf?pii=S2468-2667%2820%2930090-6>

⁴⁶ <https://www.who.int/dg/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19-15-june-2020>

⁴⁷ <https://advances.sciencemag.org/content/early/2020/05/28/sciadv.abd0086>

⁴⁸ <https://www.cdc.gov/flu/symptoms/flu-vs-covid19.htm>

⁴⁹ <https://acmedsci.ac.uk/file-download/51353957>

⁵⁰ <https://www.health.govt.nz/your-health/conditions-and-treatments/diseases-and-illnesses/influenza>

⁵¹ <https://www.health.govt.nz/our-work/preventative-health-wellness/immunisation/influenza#:~:text=Influenza%20vaccines%20for%20eligible%20children,essential%20workers%20from%2022%20April>

⁵² <https://www.influenza.org.nz/>

⁵³ https://www.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=12327712

⁵⁴ <https://www.esr.cri.nz/our-services/consultancy/flu-surveillance-and-research/>

Figure 2. Weekly hospitalisation rates for Severe Acute Respiratory Infection (SARI)

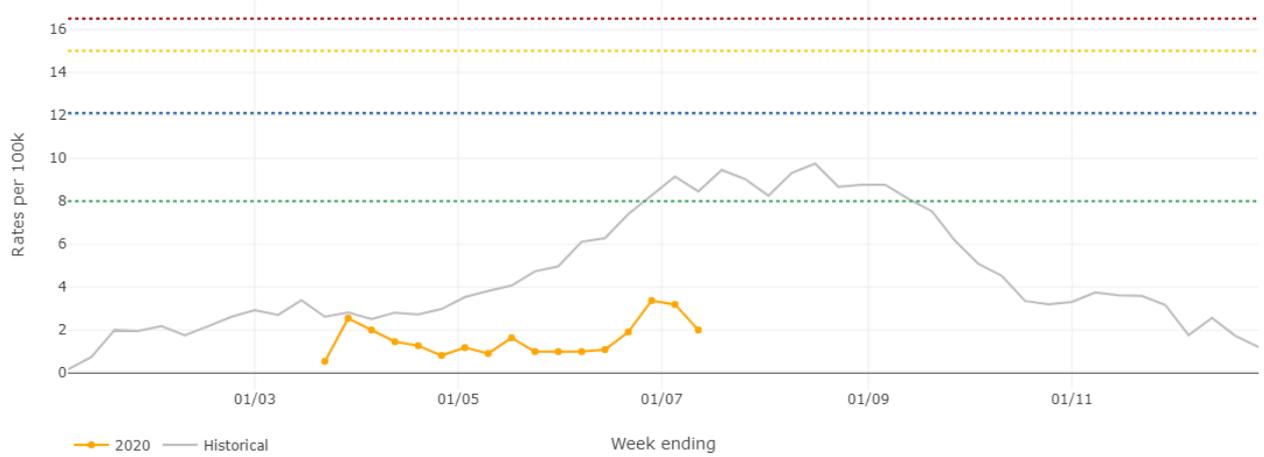


Figure 3. Weekly hospitalisation rates for Influenza-Positive SARI

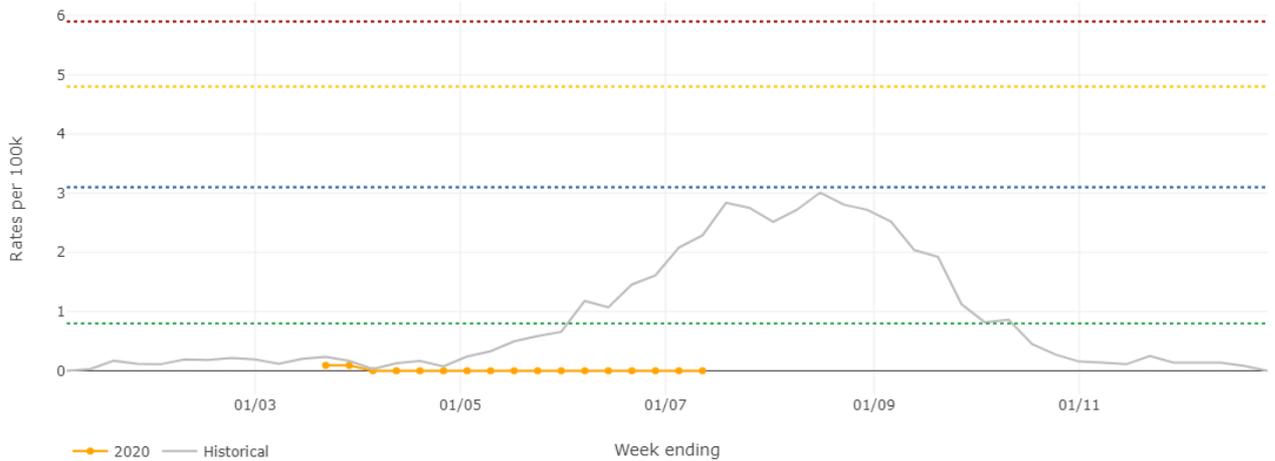
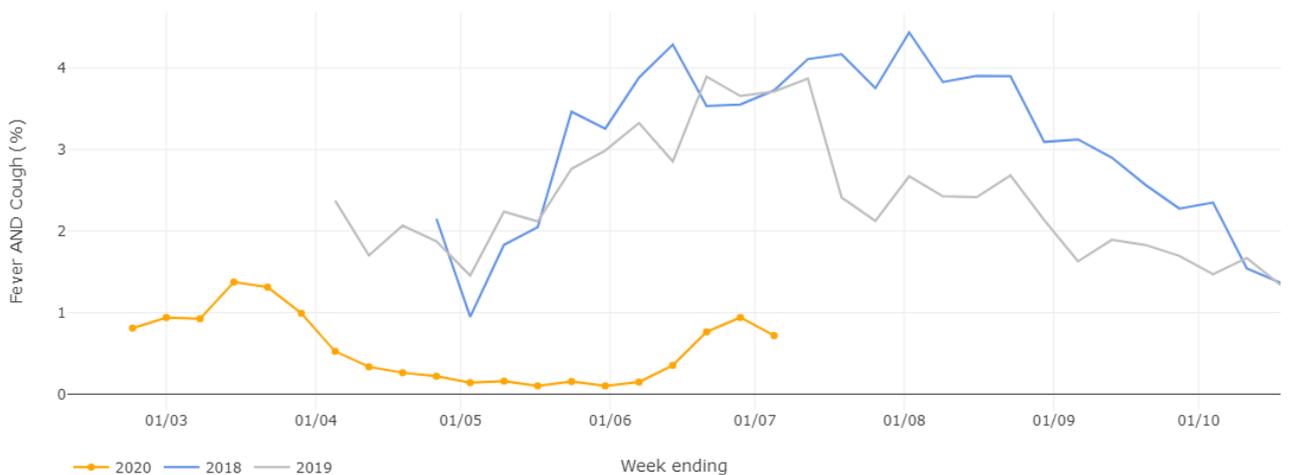


Figure 4. FluTracking Influenza-like illness symptoms, fever and cough (%)



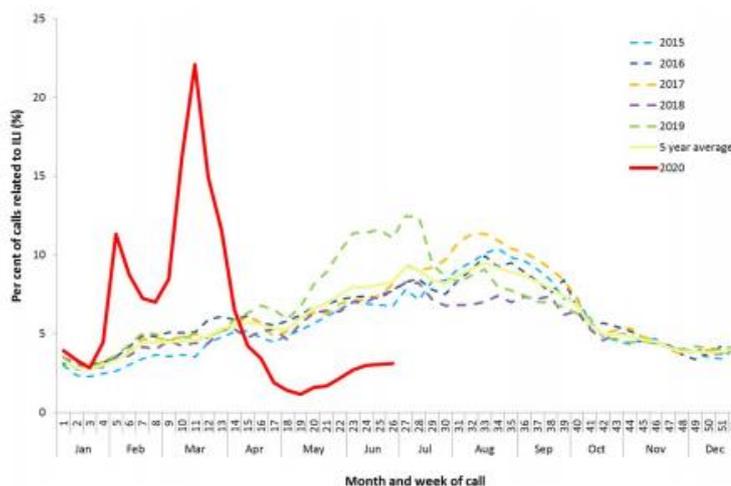
Country example: Australia⁵⁵⁵⁶⁵⁷

- Similar to New Zealand, Australian health authorities have taken additional preventative measures for the overlap between COVID-19 and the influenza season
- Early on, in March 2020, Australians were urged to get immunised for flu. More influenza vaccines were administered in 3 weeks than all of 2019
- More than 7.3 million vaccines were administered at the end of May 2020, compared to 4.5 million for the same period in 2019; and 3.5 million in 2018

Epidemiological data⁵⁸⁵⁹

- Due to the COVID-19 epidemic, data reported from the various influenza surveillance systems may not represent an accurate reflection of influenza activity
- Interpretation of 2020 influenza activity data should take into account, but not limited to:
 - ✓ the impact of social distancing measures
 - ✓ likely changes in health seeking behaviour of the community, including access to alternative streams of acute respiratory infection specific health services
 - ✓ focussed testing for COVID-19 response activities
- Activity for influenza-like illness (ILI) for this season has been lower than the average across all systems for this time of year, including surveillance through HealthDirect, FluTracking, Sentinel General Practitioners, Sentinel Laboratories, The Influenza Complications Alert Network and National Notifiable Disease Surveillance System Notifications
- The percentage of HealthDirect calls related to ILI peaked at the beginning of the year and was considerably higher than the 5-year average; then since approximately mid-April, the percentage of calls related to ILI was considerably lower than the 5-year average (*Figure 5*)
- Data from FluTracking shows that compared to the 5-year average, the percentage of participants in Australia reporting fever and cough is considerably lower in 2020. This is similar to the pattern observed in New Zealand (*Figure 6*)
- Influenza hospitalisations at sentinel hospitals in 2020 are considerably lower compared to previous years; with little variation week on week (*Figure 7*)
- Notifications of laboratory confirmed influenza from the beginning of April 2020 onwards is considerably lower than the 5-year average; with little variation week on week (*Figure 8*)

Figure 5. Percent of calls to HealthDirect related to ILI, Australia 2015 – 06/2020 by month and year



Source: Healthdirect

⁵⁵ <https://www1.health.gov.au/internet/main/publishing.nsf/Content/cda-surveil-ozflu-flucurr.htm>

⁵⁶ <https://www.health.gov.au/health-topics/immunisation/immunisation-services/flu-influenza-immunisation-service-0>

⁵⁷ <https://www.health.gov.au/ministers/the-hon-greg-hunt-mp/media/record-flu-vaccines-in-2020-to-protect-australians>

⁵⁸ <https://www1.health.gov.au/internet/main/publishing.nsf/Content/cda-surveil-ozflu-flucurr.htm#current>

⁵⁹ [Australian Influenza Surveillance Report, No.6, 2020, 15 June to 28 June 2020](https://www1.health.gov.au/internet/main/publishing.nsf/Content/cda-surveil-ozflu-flucurr.htm#current)

Figure 6. Proportion of fever and cough among FluTracking participants, Australia, between February and October 2015-2020 by month and week

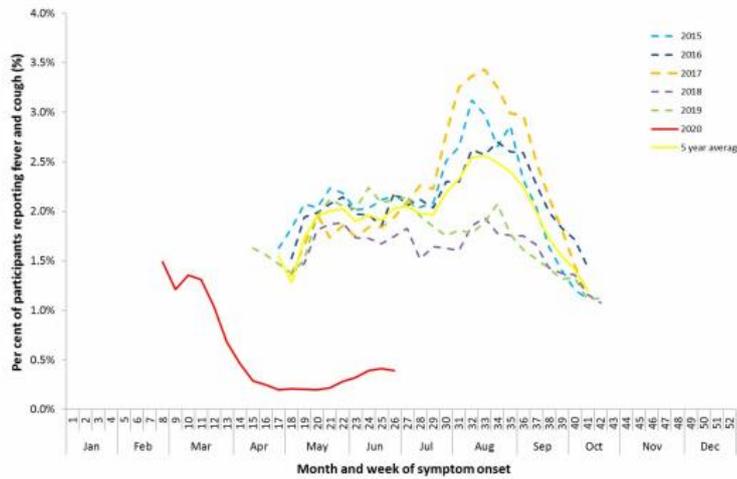


Figure 7. Number of influenza hospitalisations in sentinel hospitals between March and October, 2014-2020 by month and week

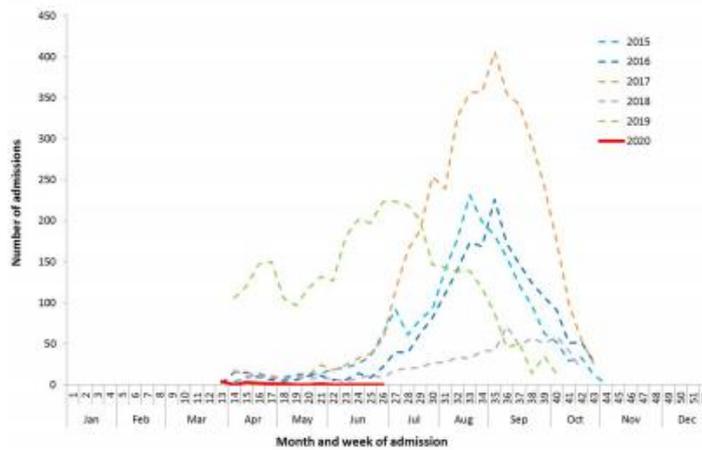
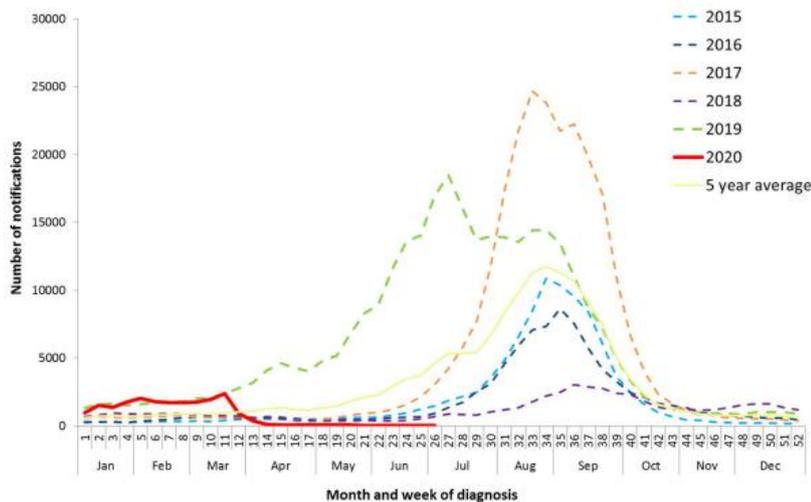


Figure 8. Notifications of laboratory confirmed influenza, Australia, 2013-06/2020, by month and week of diagnosis



COVID-19 risk communication

Overview and key considerations⁶⁰⁶¹⁶²⁶³⁶⁴⁶⁵

- Every mass public health intervention raises **ethical and human rights concerns**
- **Scientifically sound risk communication** requires:
 - ✓ explicit analysis of the decisions facing people
 - ✓ empirical assessment of relevant beliefs, values and decision-making processes
 - ✓ development and empirical evaluation of messages, focusing on the facts critical to individuals' choices
- **WHO best practice of risk communication** highlights **eight key points**:
 1. Create and maintain trust
 2. Acknowledge and communicate even in uncertainty
 3. Coordinate
 4. Be transparent and fast with the first and all communications
 5. Be proactive in public communication
 6. Involve and engage those affected
 7. Use integrated approaches
 8. Build national capacity, support national ownership
- **Public education campaigns** should be grounded in the science of risk communication, as the acceptability of health measures is vital to community adherence
- **Key predictors of adherence to / compliance with measures**, include: levels of perceived susceptibility to, severity of and risk from the disease; belief in the effectiveness of the recommended behaviours; levels of anxiety, fear and trust in authorities
- **Inequalities in access to resources** can affect the ability to comply with recommended measures
- **Messages are most influential** when specific to communities and groups with shared identity, providing in-group models for norms or health behaviours
- **Information disseminated** should be accurate, clear, uncomplicated, not sensationalistic or alarmist, and as reassuring as possible
- **Optimism bias**' is the belief that bad things are less likely to happen to oneself, useful for avoiding negative emotions, but also underestimating risk and reducing compliance
- **Communication strategies must strike a balance** between breaking through optimism bias without inducing excessive feelings of anxiety and fear
- Members of **racial and ethnic minorities communities** may be more likely to be distrustful in the public health information they receive, less willing to adopt recommended safety measures and potentially more susceptible to 'fake news'
- Being **older, female, more educated or non-white**, is associated with a higher chance of **adopting protective behaviours**

⁶⁰ <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.365.6824&rep=rep1&type=pdf>

⁶¹ <http://origin.who.int/risk-communication/training/Module-B3.pdf>

⁶² <https://www.nature.com/articles/s41562-020-0884-z>

⁶³ <https://www.ncbi.nlm.nih.gov/books/NBK54163/>

⁶⁴ <https://onlinelibrary.wiley.com/doi/full/10.1348/135910710X485826>

⁶⁵ https://academic.oup.com/jid/article/214/suppl_4/S404/2527912

Country examples

The below communications case studies have been analysed through an abbreviated best practice framework⁶⁶, including five criteria: Transparency, Inclusivity, creating and maintaining Trust, Pro-active communication and Management of uncertainty.

Case study I: Germany communications on wearing face masks / covering

- Wearing face masks is considered part of a comprehensive package for prevention and control of certain respiratory viral diseases, including COVID-19, especially in enclosed public spaces, such as shops and public transport^{67,68,69}
- All 16 German Federal States have decided to apply wearing of nose-mouth coverings / 'community' (non-medical) masks from April 2020 in certain circumstances / places where social distancing (1.5 meters) is difficult to maintain / comply with^{70,71,72,73} (Table 3)
- A consistent approach is implemented across all States with slight variation in implementation; and masks mandatory in all shops, retail stores and public transport (Table 3)
- Scarves and improvised fabric coverings are allowed where purpose-made masks are not available; medical masks are reserved for health workers⁷⁴
- Adherence is not strictly monitored, though penalty fees are introduced in several States⁷⁵
- The public is constantly informed about wearing masks through several TV channels⁷⁶
- Information, evidence and promotional materials on using face masks / coverings are provided through different state levels and organisations, for example:
 - ✓ The *German Federal Government* informs about new regulations and advises how to implement them
 - ✓ The *German Federal Institute for Pharmaceuticals and Medical Products*⁷⁷ gives advice on the correct usage and the different types of face masks available
 - ✓ The *Robert Koch Institute*⁷⁸; the *Federal Centre for Health Education*⁷⁹ and the *Infection Protection Agency (Infektionsschutz)*^{80,81} provide the latest available evidence and information on: differences of nose-mouth coverings / medical masks; levels of protection; handling, cleaning and storage instructions; promotional materials, etc.
 - ✓ Public consensus have been strengthened by promoting emerging research from the *German Institute of Labour Economics*⁷³, revealing reduced spread of COVID-19 in several regions/cities after introducing mandatory face masks in public⁸²
- Overall, communications approach to encourage wearing masks to limit the spread of COVID-19, can be considered successful in Germany, with widespread uptake and limited opposition (best practice framework analysis is provided on Figure 9)

⁶⁶ <http://origin.who.int/risk-communication/training/Module-B3.pdf>

⁶⁷ [https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public/when-and-how-to-use-masks&publication=rational-use-of-personal-protective-equipment-for-coronavirus-disease-\(covid-19\)-and-considerations-during-severe-shortages](https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public/when-and-how-to-use-masks&publication=rational-use-of-personal-protective-equipment-for-coronavirus-disease-(covid-19)-and-considerations-during-severe-shortages)

⁶⁸ <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public/when-and-how-to-use-masks>

⁶⁹ <https://maskenpflicht.org/bedeutung>

⁷⁰ <https://www.bundesregierung.de/breg-de/themen/coronavirus/oePNV-schutzmassnahmen-1745060>

⁷¹ <https://www.bundesregierung.de/resource/blob/975226/1744452/b94f2c67926030f9015985da586caed3/2020-04-16-bf-bk-laender-data.pdf?download=1>

⁷² <https://www.zdf.de/nachrichten/zdf-mittagsmagazin/diskussion-ueber-maskenpflicht-in-deutschland-100.html>

⁷³ <http://ftp.iza.org/dp13319.pdf>

⁷⁴ <https://www.bfarm.de/SharedDocs/Risikoinformationen/Medizinprodukte/DE/schutzmasken.html>

⁷⁵ <https://www.bundesregierung.de/breg-de/themen/coronavirus/maskenpflicht-in-deutschland-1747318>

⁷⁶ <https://www.tagesschau.de/inland/corona-deutschland-mundschutz-101.html>

⁷⁷ <https://www.bfarm.de/SharedDocs/Risikoinformationen/Medizinprodukte/DE/schutzmasken.html>

⁷⁸ https://www.rki.de/DE/Content/Infekt/EpidBull/Archiv/2020/19/Art_02.html

⁷⁹ <https://www.bzga.de/>

⁸⁰ <https://www.infektionsschutz.de/coronavirus/verhaltensregeln/mund-nasen-bedeckungen.html?L=0>

⁸¹ <https://www.infektionsschutz.de/>

⁸² https://www.rki.de/DE/Content/InfAZ/N/Neuartiges_Coronavirus/Situationsberichte/2020-04-01-de.pdf?__blob=publicationFile

Table 3: Overview of regional variation in the obligation to wear a mask in the Federal States of Germany⁸³⁸⁴

State	Type of protection	Place where mandatory	Fines for non-compliance
Baden-Württemberg	Mouth-nose cover, scarf, community or self-sewn masks	Retail stores, supermarkets	15-30€
Bavaria		Public transport, retail stores, supermarkets	150€*
Berlin	Mouth-nose protection, scarf, cloth	Public transport, retail stores, supermarkets	50-500€
Brandenburg	Mouth-nose mask	Public transport, retail stores, supermarkets	No fine imposed yet
Bremen	Mouth nose cover, scarf, community or self-sewn masks	Public transport, shopping in enclosed spaces	No fine imposed yet
Hamburg	Surgical masks, masks from DIY store or pharmacy, fabric, self-sewn or community masks, scarf	Retail stores, supermarkets, public transport, care/nursing homes	500-1000€
Hesse	Any mouth-nose protection that prevents the transmission of droplets and aerosols	Retail stores, supermarkets, public transport, post offices	50€ in case of repeated violation
Lower Saxony	Mouth-nose protection, everyday masks, scarf	Retail stores, supermarkets, public transport	No fine imposed yet (except for Wolfsburg 50€)
Mecklenburg-Vorpommern	Mouth-nose cover	Retail stores, supermarkets, public transport and taxi services	25€
North Rhine-Westphalia	Textile mouth-nose cover, everyday / community mask, scarf	Retail, banks, post offices, exhibition rooms, weekly markets, shopping malls, gastronomic, crafts and services establishments, healthcare facilities, public transport and taxi services	No fine has been imposed yet (Except for: Aachen 35€ and Cologne 150€)
Rhineland-Palatinate	Mouth-nose protection, everyday masks, scarves	Retail stores, supermarkets, public transport	10€**
Saarland	Mouth-nose protection, everyday masks, scarves	Retail stores, supermarkets, public transport	No fine imposed yet
Saxony	Mouth-nose protection	Retail stores, supermarkets, public transport	No fine imposed yet
Saxony-Anhalt	Mouth-nose protection, textile barriers such as scarf, buffs, custom-made masks	Retail stores, supermarkets, public transport	No fine imposed yet
Schleswig-Holstein	Mouth-nose cover, fabric masks, scarf, makeshift / everyday masks	Retail stores, supermarkets, public transport	No fine imposed yet
Thuringia	Mouth-nose cover		50€

* Business owners must ensure their staff wears a mouth-nose covering; violation fine is 5,000€

** If the employees of a shop do not wear a mask, the owner may be fined 250€

⁸³ <https://infothek-gesundheit.de/maskenpflicht-diese-bundeslaender-und-staedte-fordern-atemschutz/>

⁸⁴ <https://www.bussgeldkatalog.org/verstoss-maskenpflicht/>

Figure 9. Analysis of the German Federal Government communications for using face masks



Case study II: COVID-19 contact tracing applications (apps) in three countries

- Research suggests the possibility for using contact-tracing apps to monitor and control epidemics, such as COVID-19⁸⁵
- Application based contact tracing is currently rolled out in many countries^{86,87,88,89} and is thought to have the advantage of fewer or no lockdowns, which come at a great cost for the economy and the health and well-being of populations⁹⁰
- Concerns, related to the ‘surveillance state’, e.g. potential for misuse by state actors, remain prominent in the three countries reviewed: Germany, Iceland and Singapore
- Despite these concerns, uptake rates in Iceland and Singapore have been high
- Historical factors, specifically the state of surveillance in former East Germany, have been highlighted as detrimental to the uptake of such apps
- The three countries have successfully managed to contain the spread of the virus, resulting in public scepticism towards the need for using contact tracing apps

⁸⁵ <https://pubmed.ncbi.nlm.nih.gov/32234805/>

⁸⁶ <https://www.hsj.co.uk/free-for-non-subscribers/nhs-developing-coronavirus-contact-tracking-app/7027163.article>

⁸⁷ <https://www.pepp-pt.org/>

⁸⁸ <https://www.blog.google/inside-google/company-announcements/apple-and-google-partner-covid-19-contact-tracing-technology/>

⁸⁹ <https://www.tracetgether.gov.sg/>

⁹⁰ <https://www.imperial.ac.uk/media/imperial-college/medicine/sph/ide/gida-fellowships/Imperial-College-COVID19-NPI-modelling-16-03-2020.pdf>

Germany⁹¹⁹²⁹³

- A COVID-19 app helps to warn when someone has been in contact with an infected person to enable interrupting the chain of infection faster
- The app is offered by the German Federal Government completely voluntary and free with detailed information on the app and related data available on the Government and *Robert Koch Institute* websites
- 15.6 million people have downloaded the app so far (13/07/2020)

Iceland⁹⁴

- Nearly 40% of population have downloaded the COVID-19 app 'Rakning C-19'
- The app is an important link in the chain of response, helping to analyse individuals' travel and tracing movement against other people when cases of (suspected) infection arise
- Data shows that over half of those who have tested positive were already in quarantine when their infection was confirmed

Singapore⁹⁵⁹⁶⁹⁷⁹⁸

- A smartphone app to monitor COVID-19 spread is tracking people who may have been exposed to a confirmed (+ve test) case
- 2.1 million people have downloaded the app so far (15/07/2010)
- The government's high-tech approach has helped restricting COVID-19 spread and avoiding closures of business and schools
- Wearable device token complement Singapore's tracing app for people who do not own a mobile phone
- This has caused criticism due to concerns about living in a 'surveillance state' and peoples' privacy
- In contrast, tracing apps based on Google and Apple do not reveal personal identity to authorities, which remain within the individual's own decision



⁹¹ <https://www.bundesregierung.de/breg-de/themen/corona-warn-app>

⁹² <https://www.bundesregierung.de/breg-de/themen/corona-warn-app/corona-warn-app-faq-1758392>

⁹³ https://www.rki.de/DE/Content/InfAZ/N/Neuartiges_Coronavirus/WarnApp/Warn_App.html_09

⁹⁴ <https://www.covid.is/app/en>

⁹⁵ <https://www.tracetogether.gov.sg/>

⁹⁶ <https://support.tracetogether.gov.sg/hc/en-sg/articles/360048249014-General-TraceTogether-publicity-poster-available-in-different-languages->

⁹⁷ <https://www.bbc.co.uk/news/technology-53146360>

⁹⁸ <https://www.oecd.org/coronavirus/policy-responses/tracking-and-tracing-covid-protecting-privacy-and-data-while-using-apps-and-biometrics-8f394636/>

Case study III: Risk communication and civil unrest in Serbia

- The Serbian capital, Belgrade, became a scene of protests and violent clashes with police in July 2020, spreading across the country
- The primary source of the civil unrest stems from perceived mishandling of the COVID-19 pandemic crisis, particularly the re-introduction of lockdown measures
- While these events are linked to risk communication failures, they should be also viewed in a wider socio-political context, related to concerns about democratic backsliding⁹⁹¹⁰⁰, particularly surrounding media freedom and civil rights

Timeline of events

15th March	State of emergency declared with no debate in Parliament
21st March	Public transport banned, lockdown extended, entering in-door hospitality premises banned, chemists and grocery stores remain open
26th April	Protests in Belgrade against lockdown measures and growing authoritarianism
6th June	4,000 reported recoveries in a single day, attributed to change of methodology in testing ¹⁰¹ (<i>Figure 10</i>)
10th June	25,000 fans attend the Serbian National Cup semi-final between Serbia's most popular clubs ¹⁰²
21st June	Elections controversially held during the pandemic with divisive results
22nd June	The Balkan Investigative Reporting Network (BIRN) report claims Serbian Government under reporting deaths ¹⁰³
26th June	New measures imposed first in Belgrade, then in Novi Pazar and Tutin
7th July	Violent night protests in Belgrade at planned re-imposing of lockdown
10th July	Protestors attempt to storm Parliament; Government backs down from re-imposing lockdown measures

Multiple failures in public health and risk communication (*Figure 11*), including:

- A failure to justify a controversial change in the method of recording recoveries (one negative test result, as opposed to two) resulting in a dramatic change in officially recognised active cases
- A failure to effectively manage uncertainty in the early stages of the pandemic, featuring official sources downplaying the severity of the virus
- A failure to foster trust between the government and the population
- Blaming migrant workers returning from abroad as responsible for bringing the virus¹⁰⁴

⁹⁹ <https://www.tandfonline.com/doi/full/10.1080/21599165.2018.1490272>

¹⁰⁰ <https://www.tandfonline.com/doi/full/10.1080/13510347.2020.1758670>

¹⁰¹ https://www.b92.net/info/vesti/index.php?yyyy=2020&mm=06&dd=07&nav_category=12&nav_id=1692543

¹⁰² <https://www.euronews.com/2020/07/02/coronavirus-latest-serbia-sees-highest-spike-in-covid-19-cases>

¹⁰³ <https://balkaninsight.com/2020/06/22/serbia-under-reported-covid-19-deaths-and-infections-data-shows/>

¹⁰⁴ <https://balkaninsight.com/2020/04/03/serbia-pins-coronavirus-blame-on-returning-serbs-concealing-infection/>

Figure 10. Active cases in Serbia¹⁰⁵

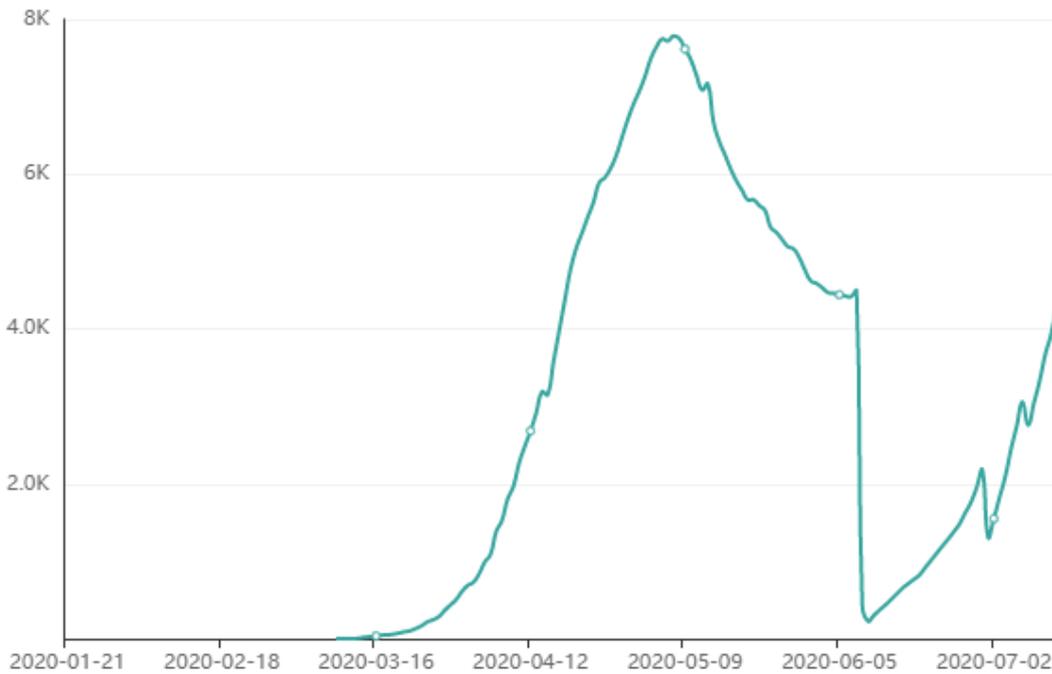


Figure 11. Analysis of the Serbian outbreak response risk communications

	<p>TRANSPARENCY</p> <ul style="list-style-type: none"> • Mixed - Initial reporting and monitoring performed reasonably, until questionable changes in recording active cases prior to the time of the election.
	<p>INCLUSIVITY</p> <ul style="list-style-type: none"> • Failure - minority languages (particularly Albanian) not present in dashboard.
	<p>CREATING AND MAINTAINING TRUST</p> <ul style="list-style-type: none"> • Failure - communications surrounding measures taken partially led to violent protesting and criticism of government handling of crisis.
	<p>PRO-ACTIVE COMMUNICATION</p> <ul style="list-style-type: none"> • Mixed - initial communications from sources linked to the President made light of the virus. Establishing of dashboard and managing of central communications improved.
	<p>MANAGEMENT OF UNCERTAINTY</p> <ul style="list-style-type: none"> • Failure - poor handling of outbreak in initial stages, and playing down of severity, likely detrimentally affected later risk communication and public trust in government.

¹⁰⁵ <https://www.bing.com/covid/local/serbia>

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