



Possible future surveillance of European vaccination coverage Reminder systems in place in Europe

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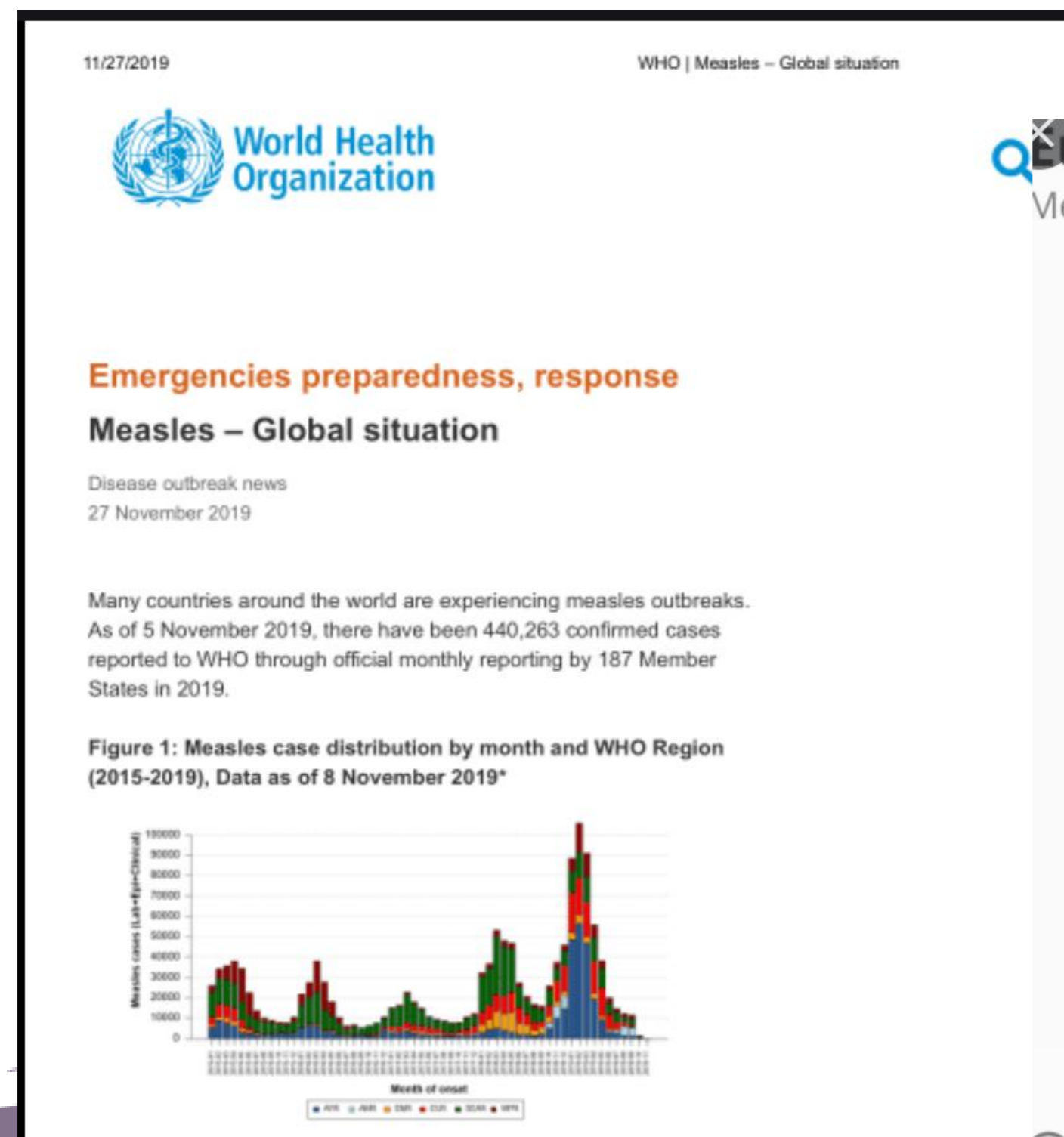
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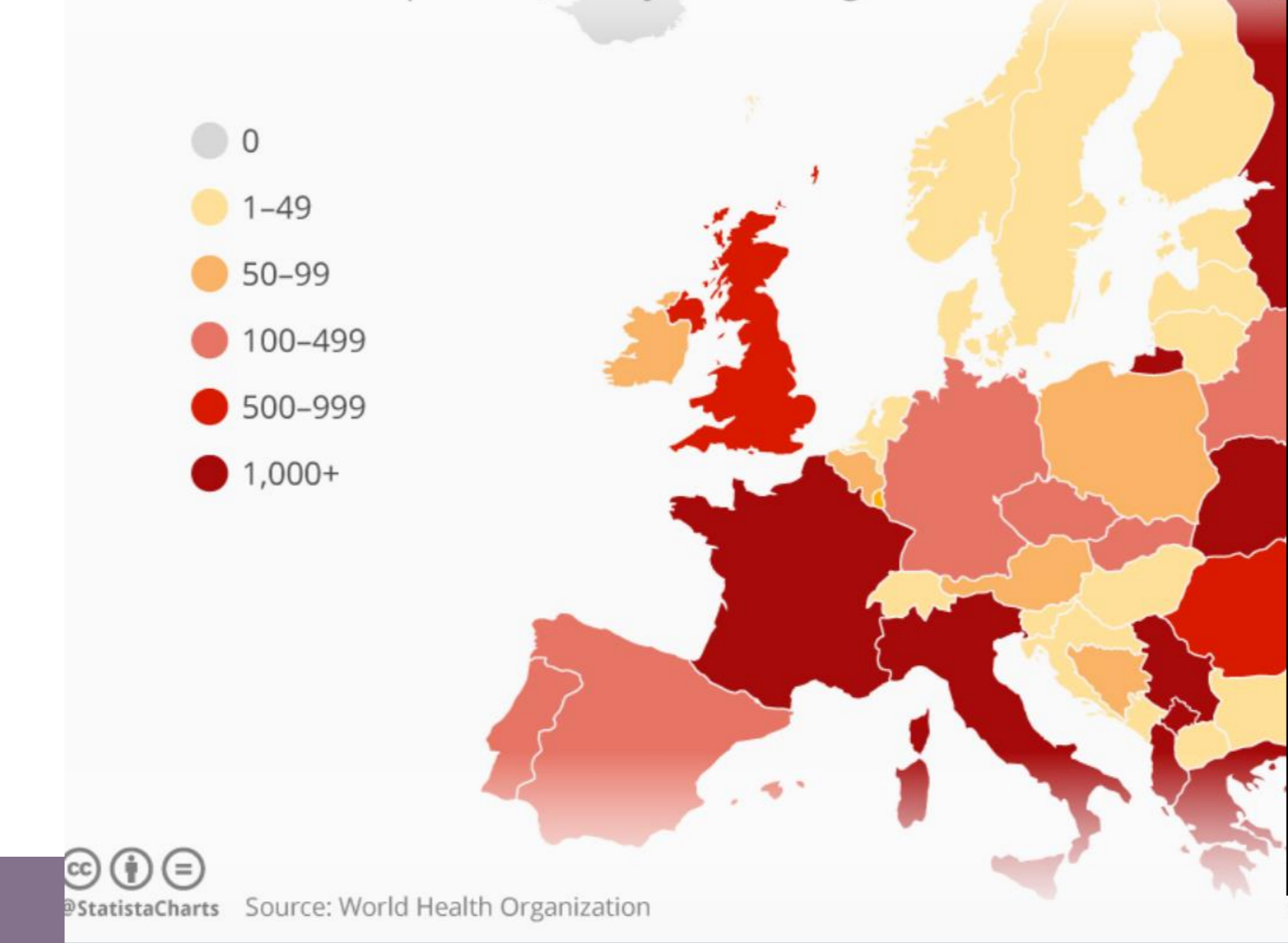
Measles as an example

- ★ Effective vaccines preventing measles infection have been available for several years
- ★ In all European childhood vaccination programmes, measles vaccination is recommended
- ★ Despite this recommendation and effective vaccines, measles outbreaks are observed from time to time in Europe



Europe Still Struggling With Major Measles Outbreak

Measles cases in Europe from January 2018 to August 2018



It is reported the Dutch minister showed Brazil's foreign office a cable saying the government has ordered the evacuation of Northern Holland and a German invasion is threatened.

AN EPIDEMIC OF MEASLES CLOSE SCHOOL

The trustees of the Red Bluff grammar schools held a meeting last night and voted to close the schools in the count of the parents. The schools will be closed on Monday morning, but will be open on Tuesday. It is expected that the schools will open for two weeks longer.

It has been found that there are four cases of measles under the age of 16 as the cases have been reported during the past few days at a rapid rate. The number of cases of measles in the Red Bluff grammar school at present is 100. It is hoped that parents will be able to control the community.

Division of Disease Control and Prevention

CAROLINE JOHNSON, MD
Deputy Health Commissioner

Health Alert

Measles and Measles-Mumps-Rubella (MMR)

May 9, 2019

Division of Disease Control and Prevention

and cases of measles in 2019, measles was eliminated in New York City and New York State. There are many unvaccinated children in New York City and New York State.

SUMMARY

- There are many unvaccinated children in New York City and New York State.
- Two MMR doses are recommended for all children.

Measles vaccine coverage

- ★ Following the recommendation to vaccinate children against measles
 - ★ Countries monitor the proportion of children vaccinated in each birth cohort – **vaccine coverage**
 - ★ The method to estimate vaccine coverage can vary between countries and is often not done real time
 - ★ A high national vaccine coverage can hide smaller subnational areas with low vaccine coverage
 - ★ Subnational or areas across borders with low measles vaccine coverage might be one of the reasons for outbreaks to evolve



How to estimate harmonized vaccine coverage

- ★ To obtain comparable vaccine coverage across borders
 - ★ A statistical tool to estimate coverage (R-package) was developed
 - ★ The countries should download and install the R-package at their local computer
 - ★ Data from immunisation information systems should be extracted in a standardized way at the same point in time across databases/countries
 - ★ Including an electronic file with the population under investigation and an electronic file with all vaccine doses administered to the population under investigation
 - ★ If action is required real-time data extraction is preferable

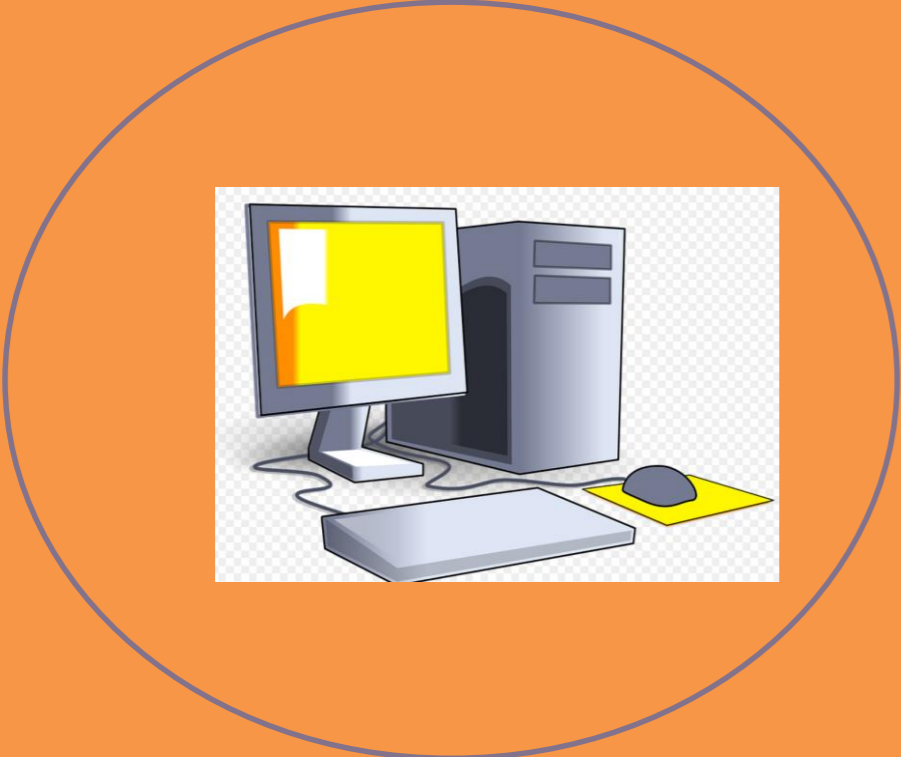


How do we identify measles immunity gaps nationally and across borders?



Local computers

- ★ Data extraction and estimation of coverage is performed locally

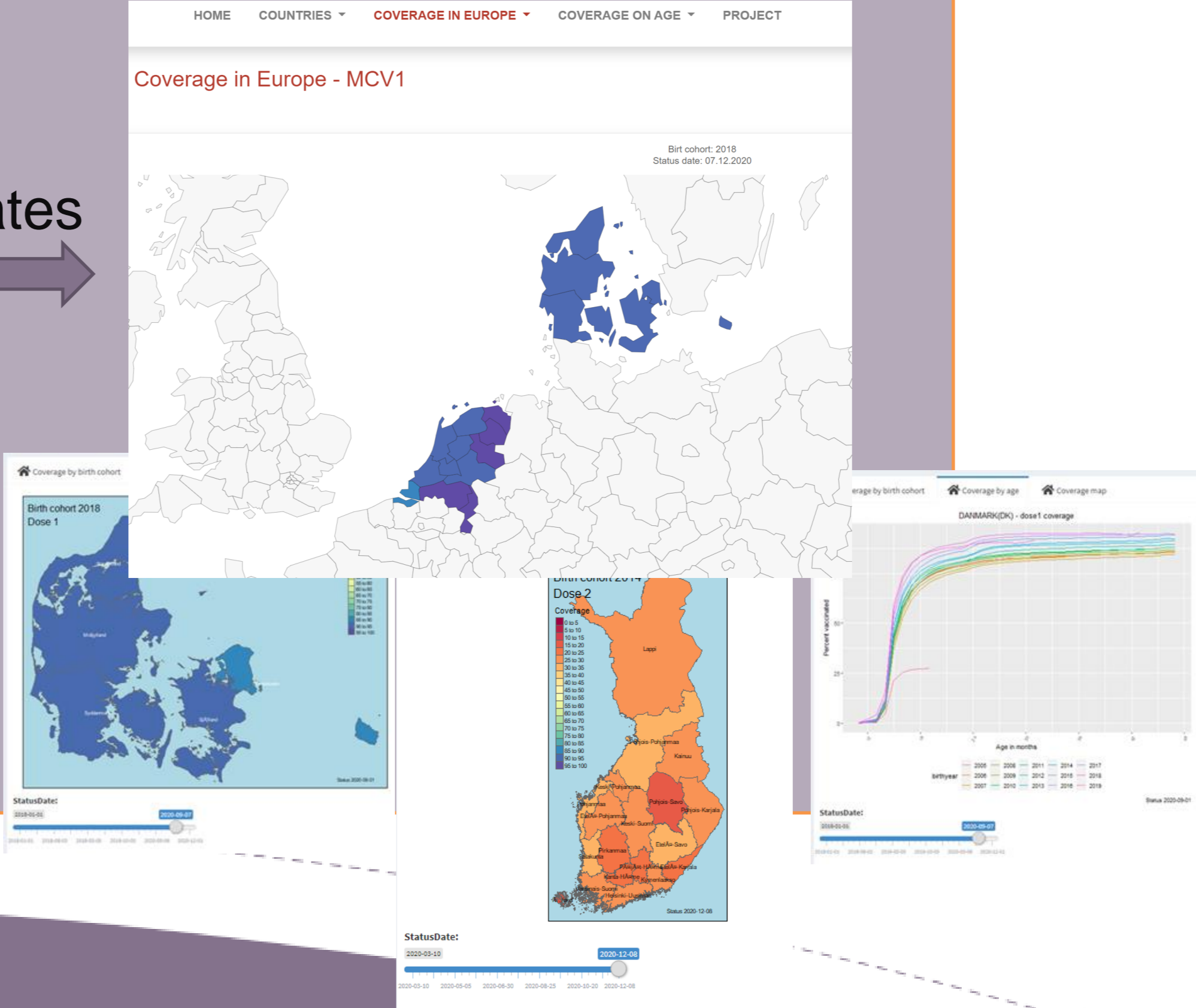


Coverage estimates



Public Platform

- ★ Only the measles coverage estimates is transferred to the platform and shown as maps, tables and graphs



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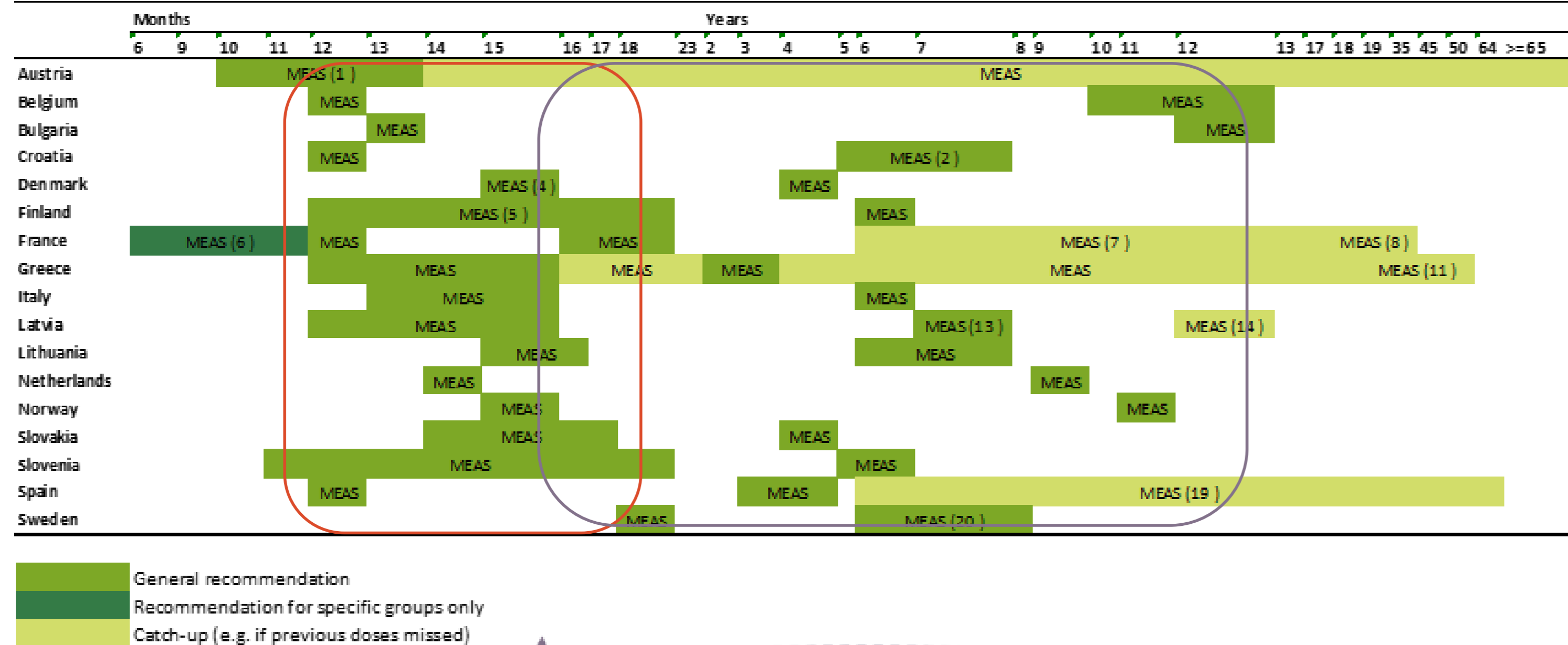
Measles vaccination schedules among JAV partners

- ★ First dose is administered mainly from 12 - 15 months of age but up until 18 months of age
- ★ Second dose is administered from 16-18 months until 12 years of age
- ★ These differences in schedules will create immunity gaps



Downloaded from ECDC homepage 13. November 2020

Measles: Recommended vaccinations



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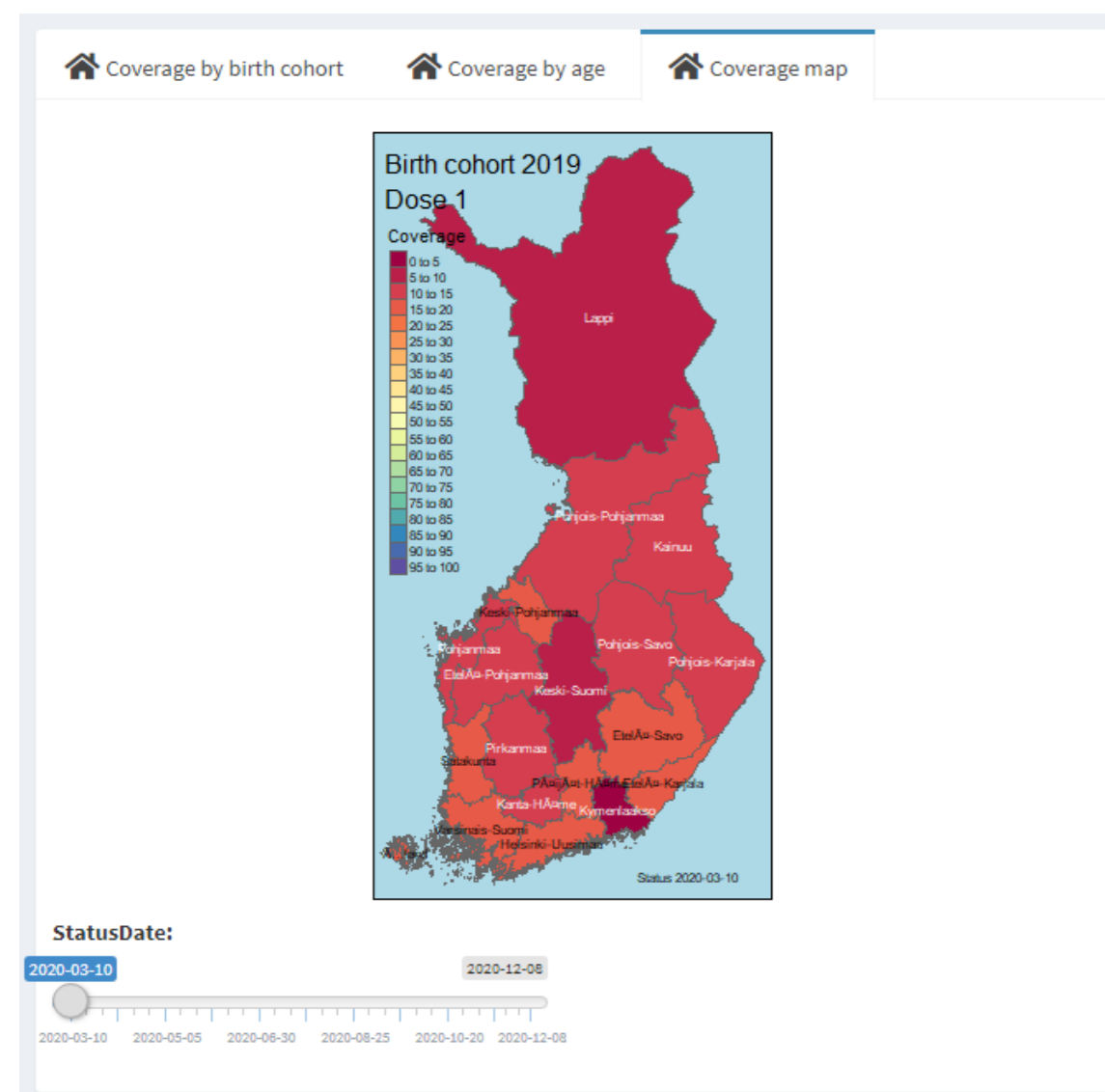
Finland

★ Recommended age of vaccination with the measles containing vaccine dose 1 is 12 months

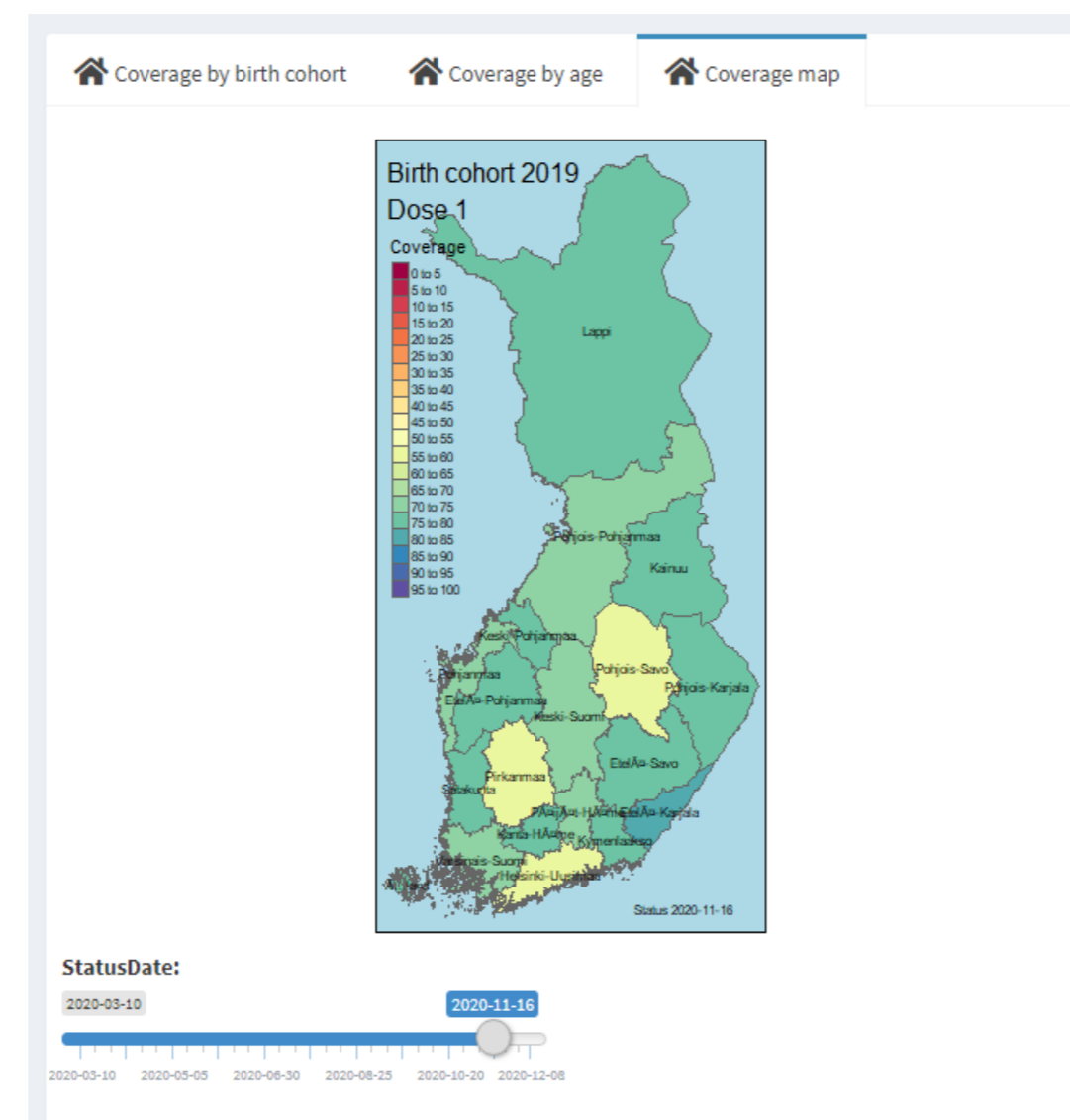
★ In 2020, it is birth cohort 2019 that should be vaccinated.



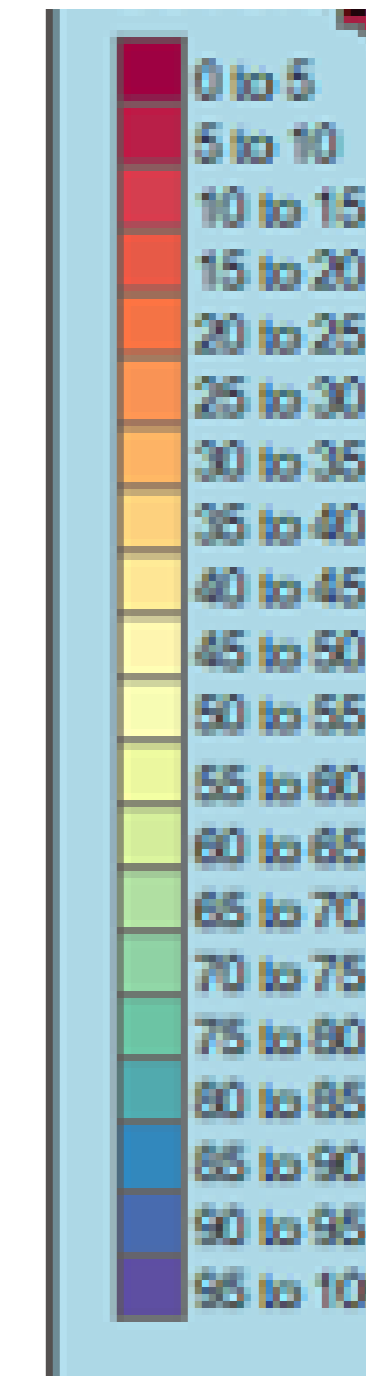
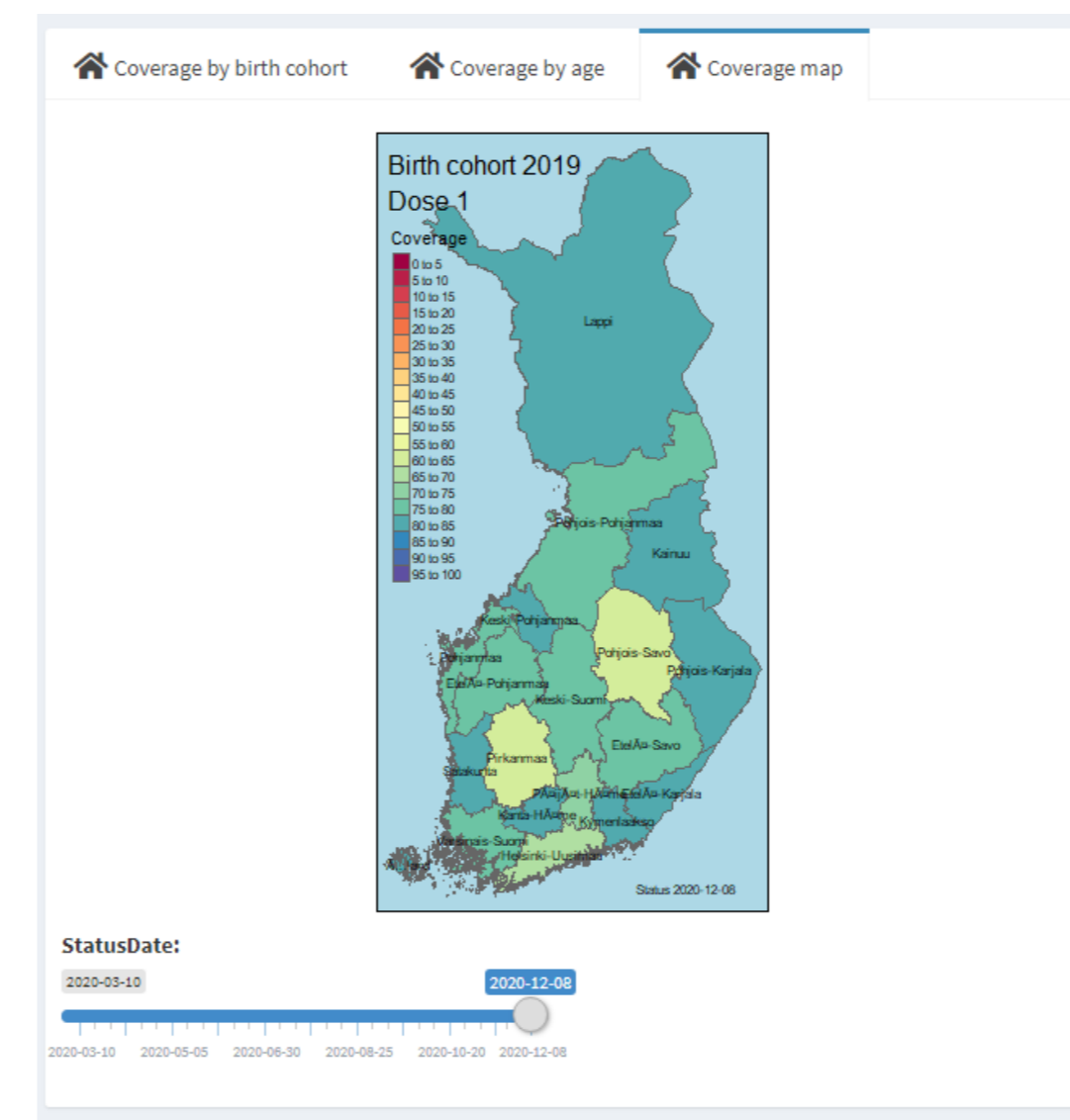
10 March 2020



16 November 2020



8 December 2020



Output from R-package



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The Netherlands (1)

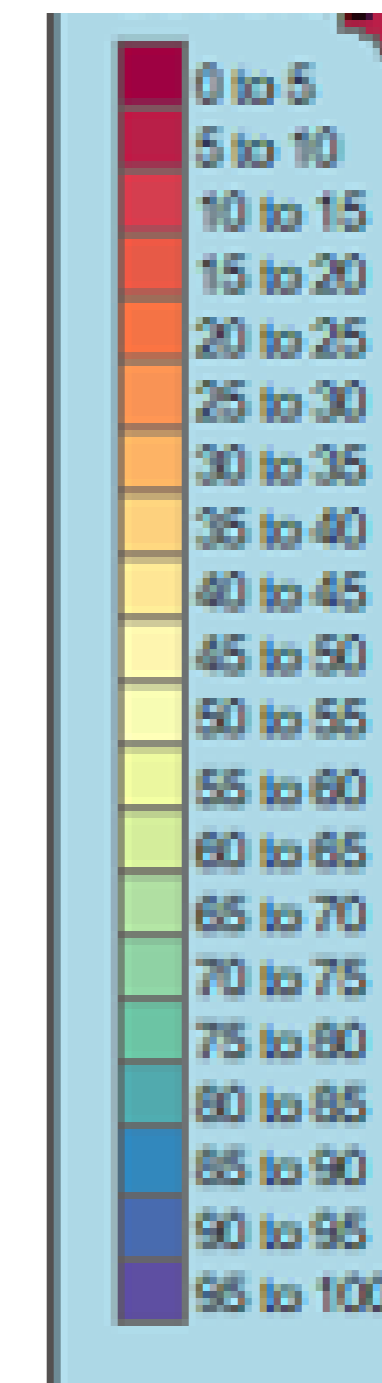
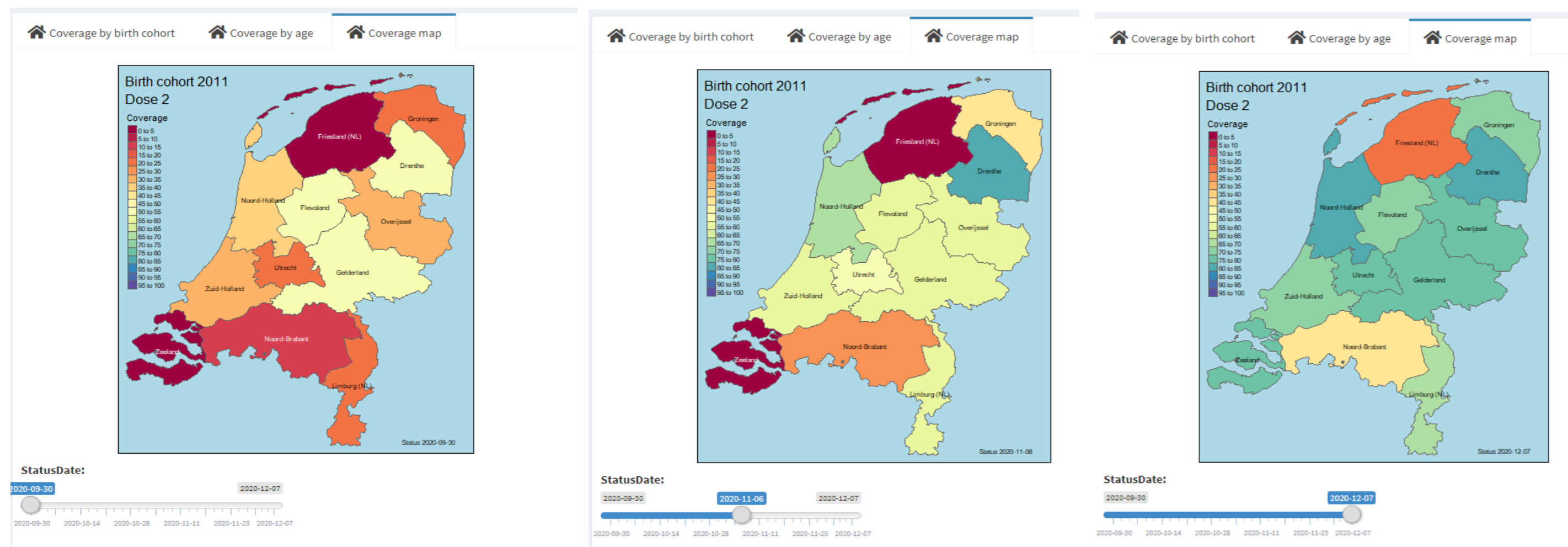
- ★ Recommended age of vaccination with the measles containing vaccine (MCV) dose 2 is 9 years of age
- ★ Birth cohort 2011 turned 9 years in 2020.
- ★ 2020 is year where birth cohort 2011 should be vaccinated with dose 2



30 September 2020

6 November 2020

7 December 2020



Output from R-package

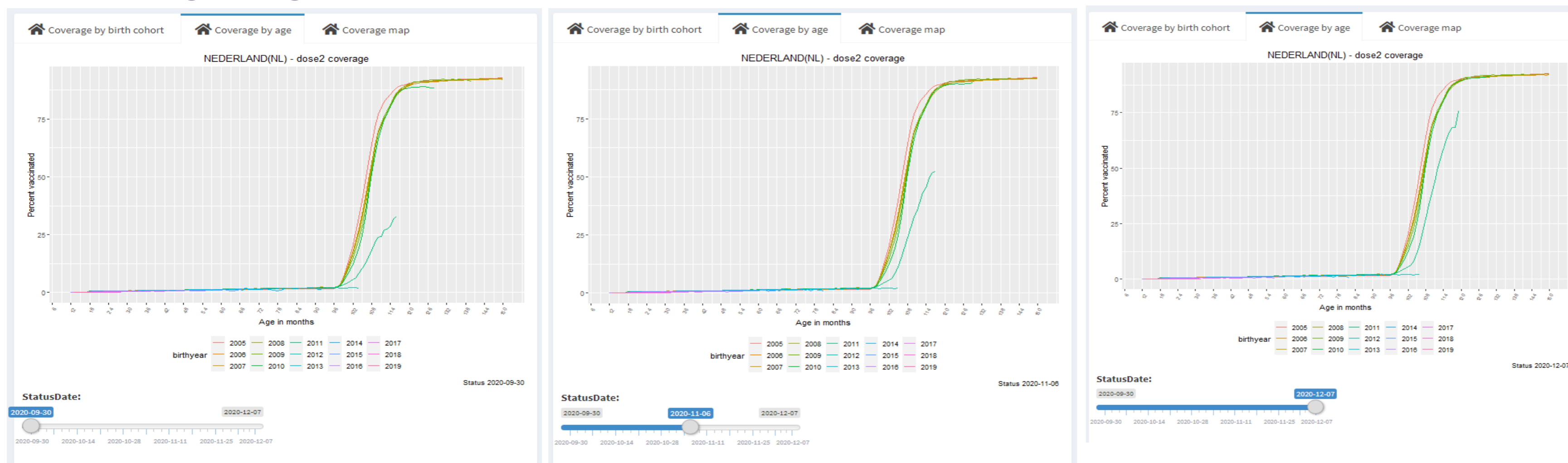


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The Netherlands (2)

- ★ Comparing coverage by age in months
- ★ Birth cohort 2011 was vaccinated later than the other cohorts
- ★ Reason: MCV dose 2 was postponed due to COVID-19 → low coverage in September 2020
- ★ Dose 2 was resumed during autumn 2020 → steep increase in coverage from end of September until beginning of December 2020



Output from R-package



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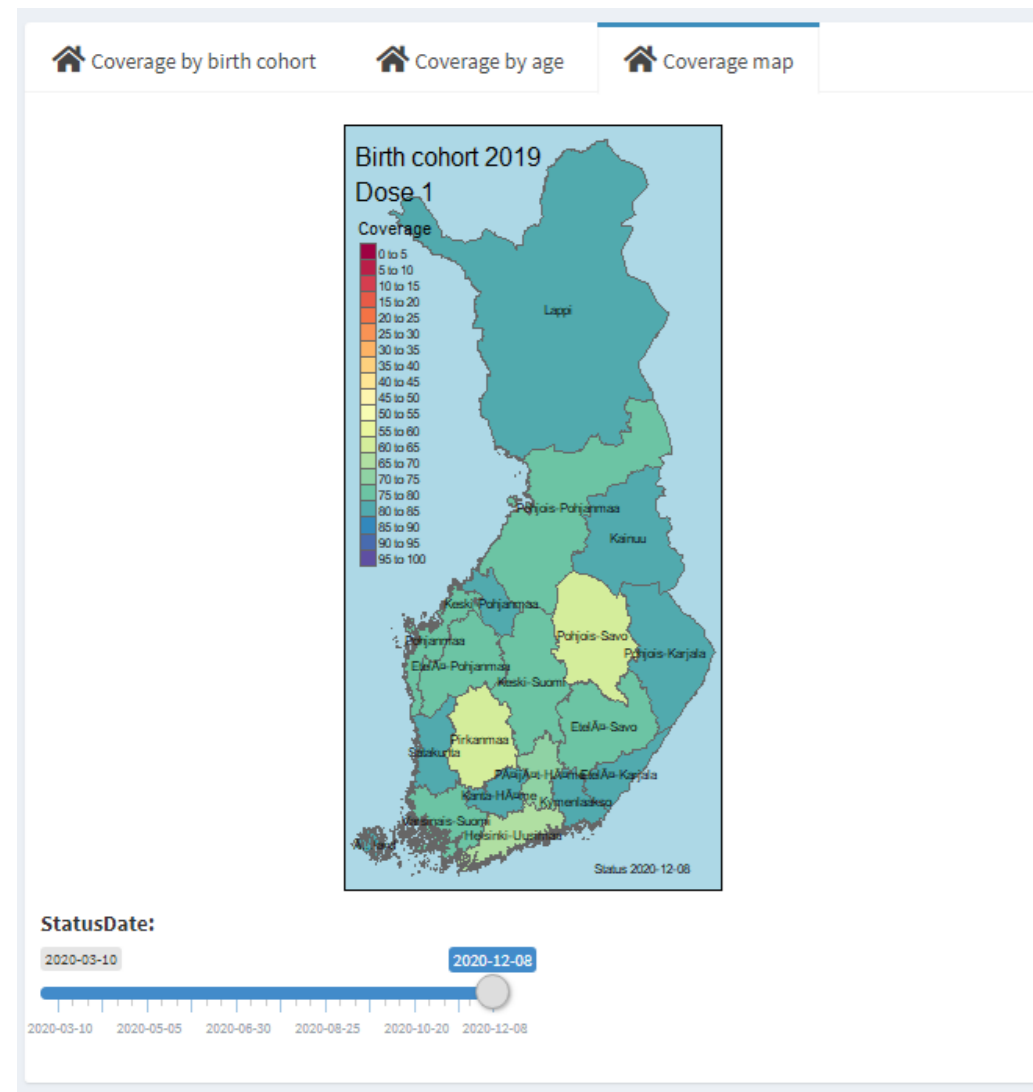
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Real-time cross border MCV Coverage, 2019 birth cohort

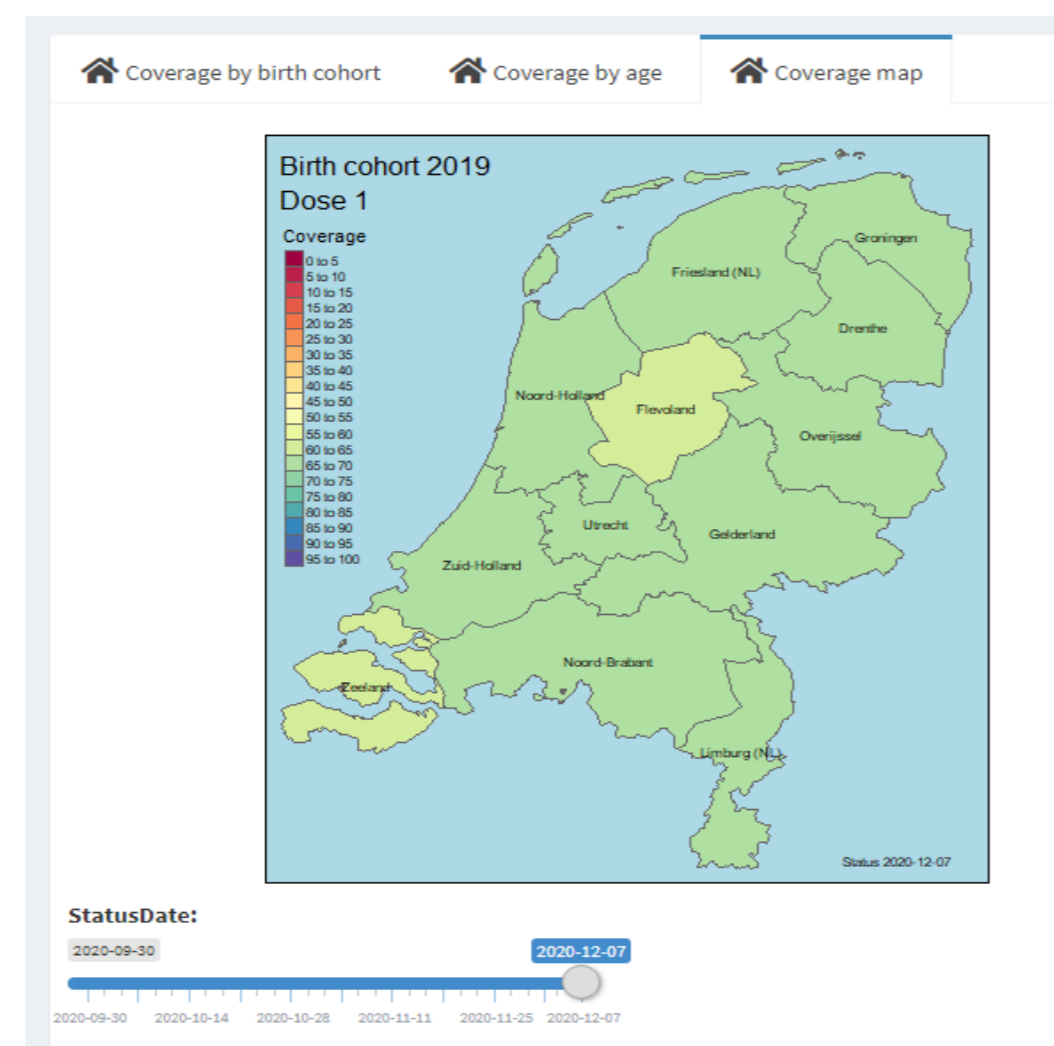
- ★ Finland, The Netherlands and Denmark extracted coverage data **beginning of December 2020**
- ★ The impact of different recommend age of vaccination between the three countries



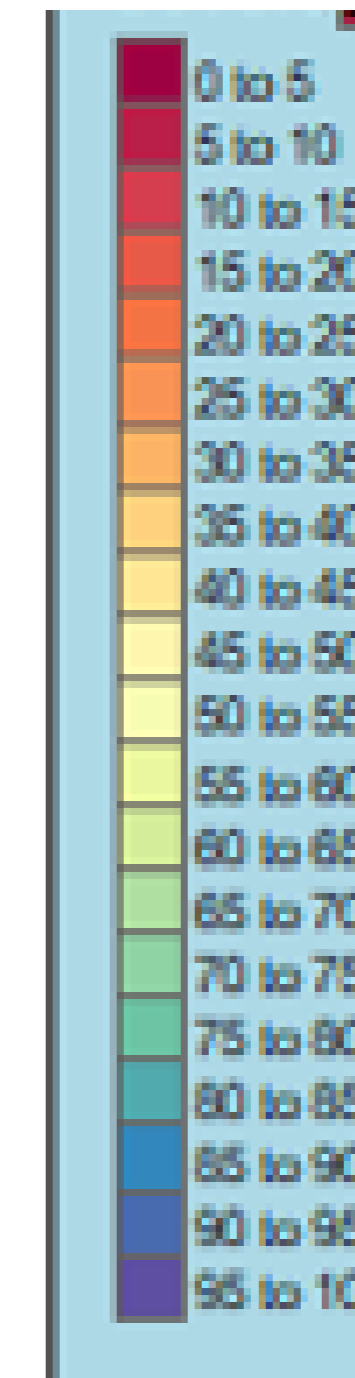
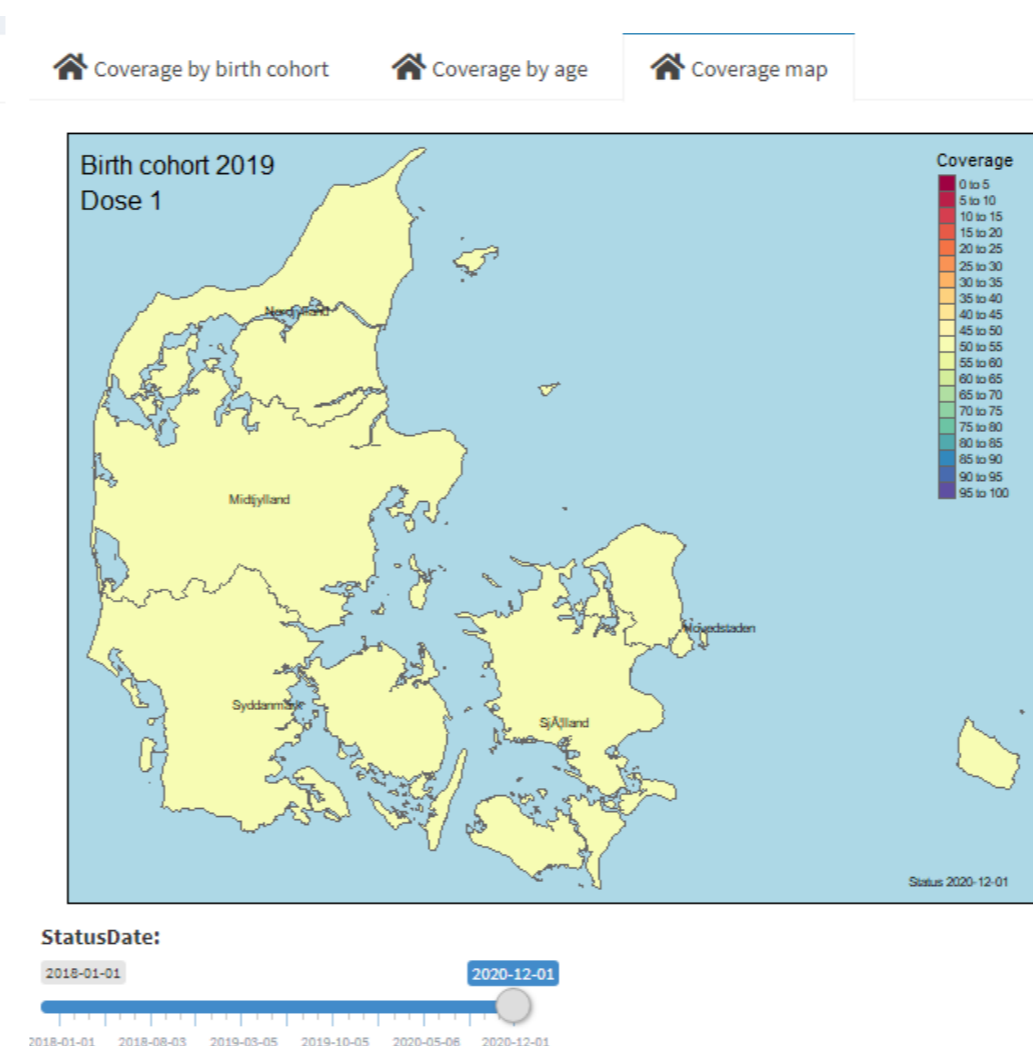
12 months



14 months



15 months



Output from R-package



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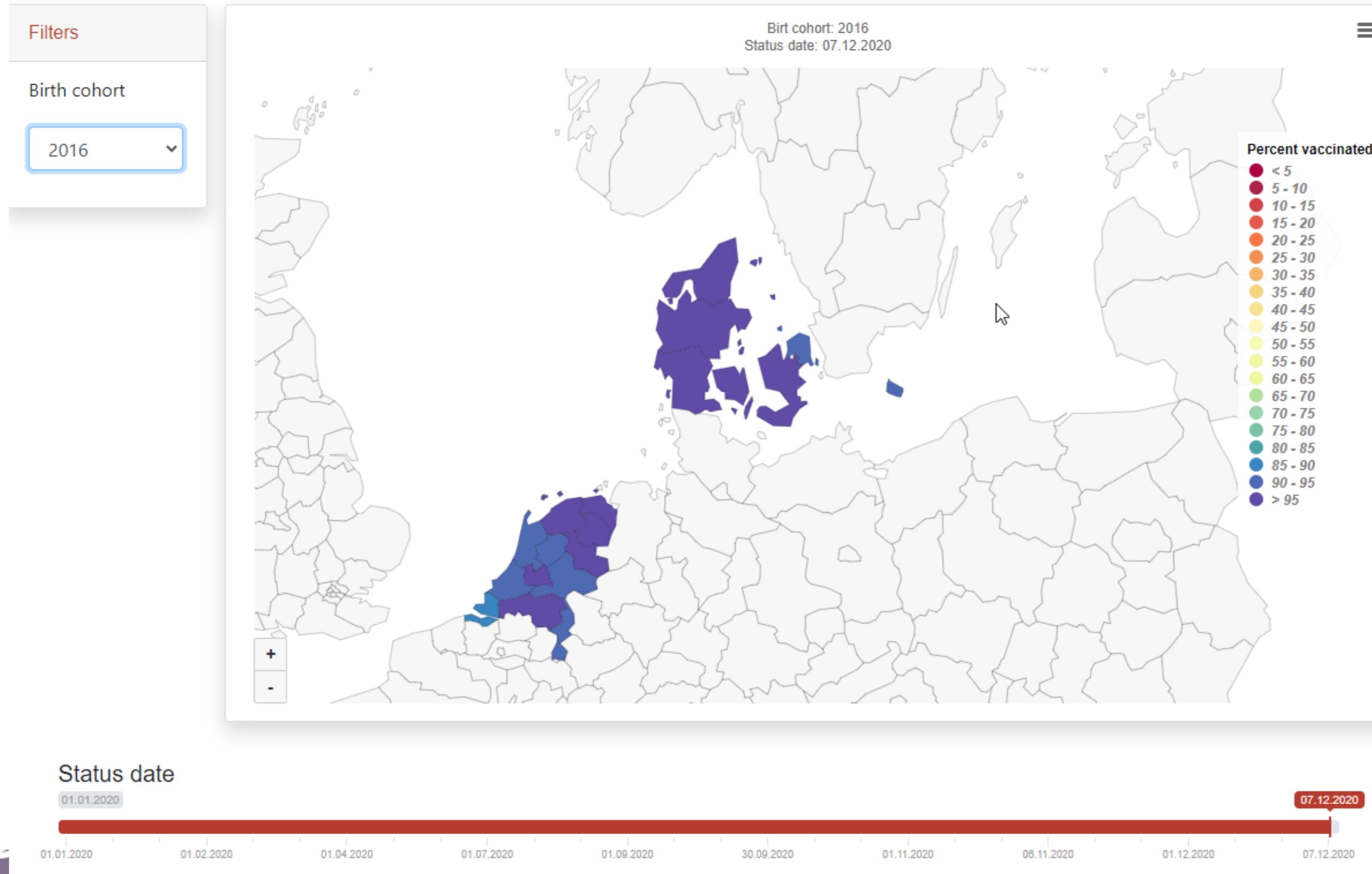
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Conclusions

- ★ Strengthen the interaction of immunization information systems can improve vaccine coverage surveillance in Europe:
 - ★ compare vaccine coverage between countries
 - ★ estimate coverage **real-time**
 - ★ **identify actual gaps in coverage**
 - ★ **to disentangle delay in vaccination from gaps in coverage**
- ★ Harmonized real-time coverage estimations provided to a public platform provides an overview of national, and regional vaccine coverage and can identify immunity gaps nationally and across borders
- ★ If real-time coverage is estimated it is **data for action**
 - ★ However, it is important to be aware that immunity gaps are created due to differences in recommended age at vaccination between countries

Demonstration of the pilotplatform: <https://eujav-platform.com/>

Coverage in Europe - MCV1

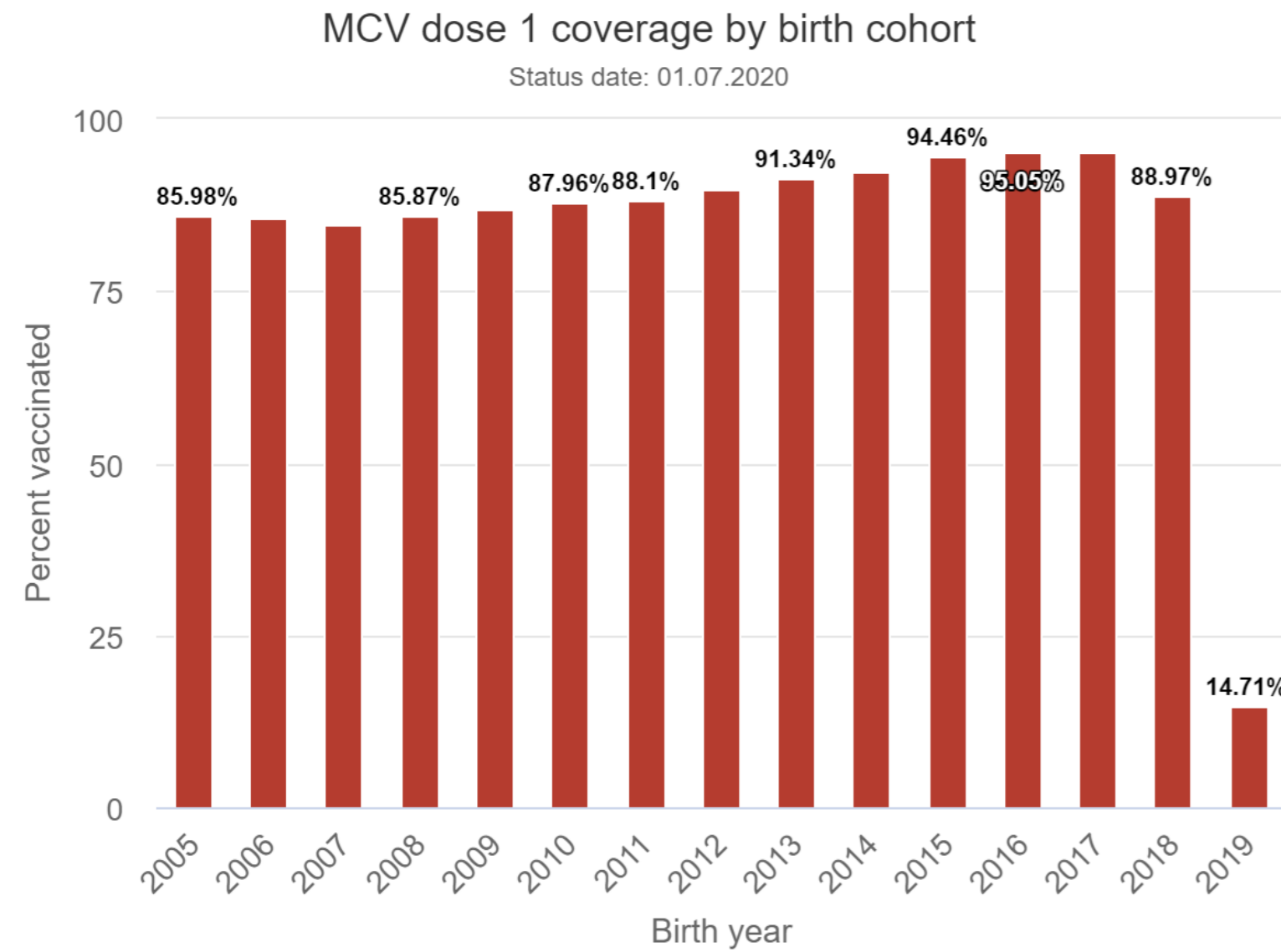


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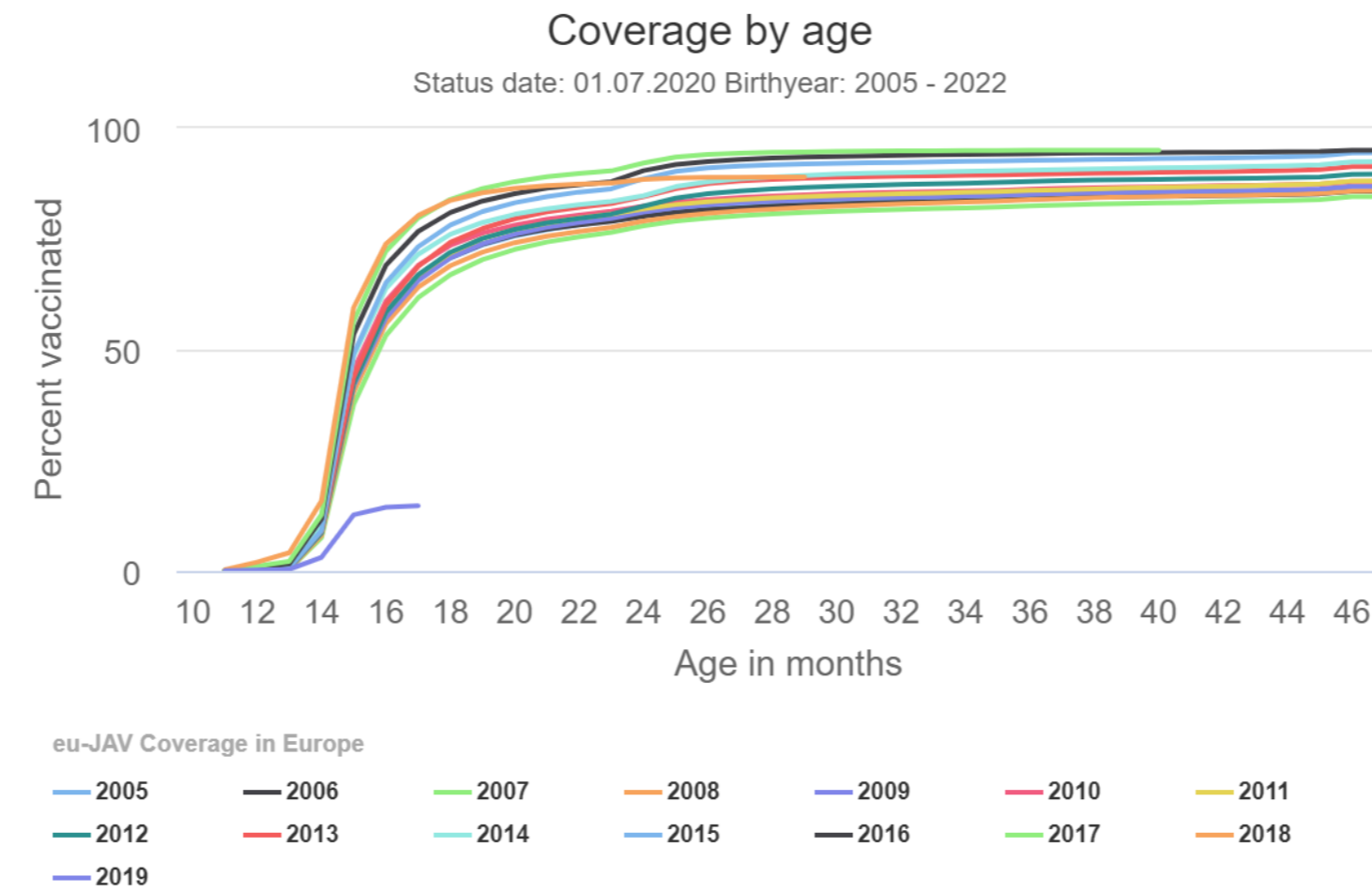
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Pilot platform

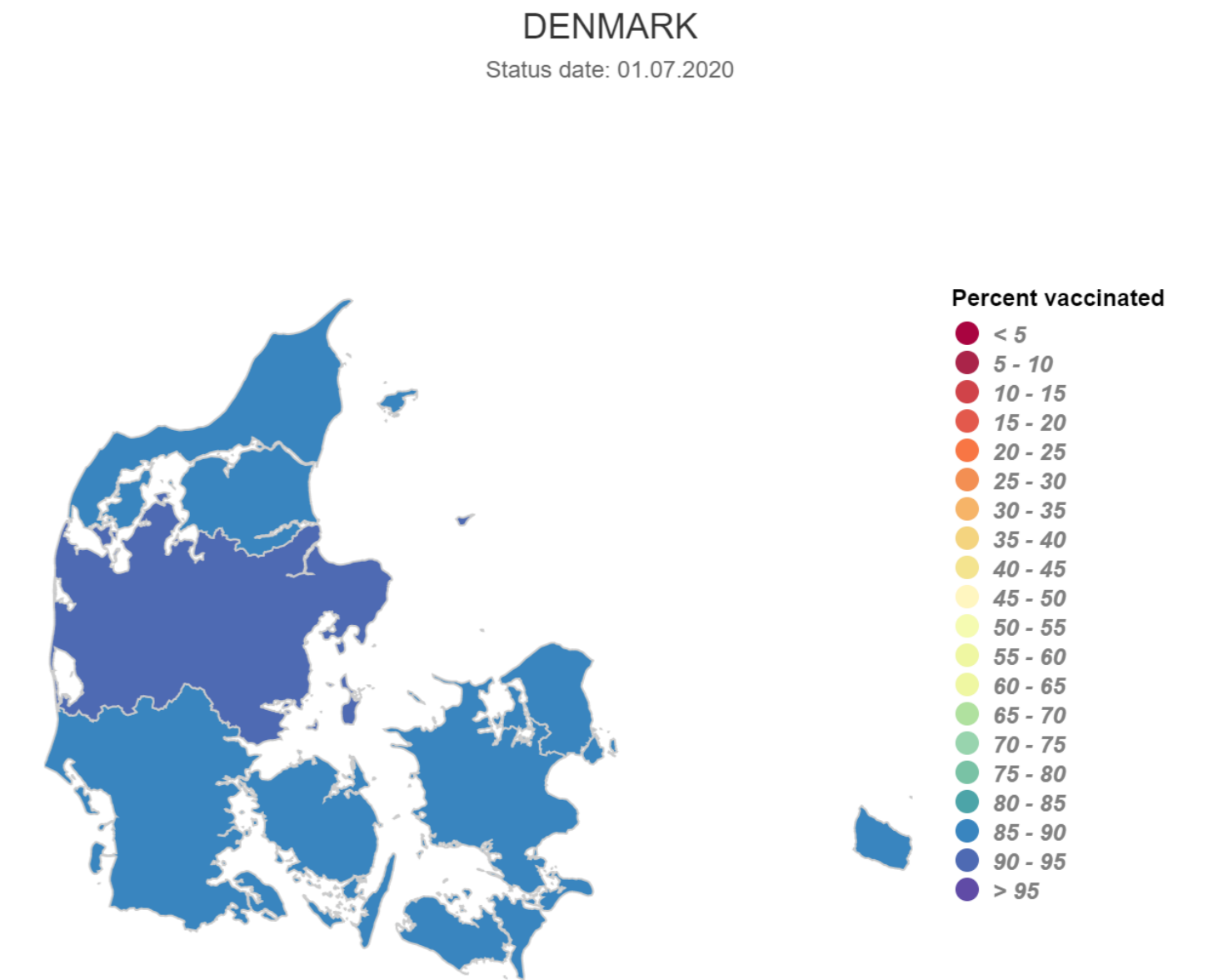
MCV dose 1 coverage from January to July 2020 in Denmark



MCV dose 1 coverage by birth cohort 2005-2019



MCV dose 1 coverage by age in month of vaccination in the birth cohorts 2005-2019

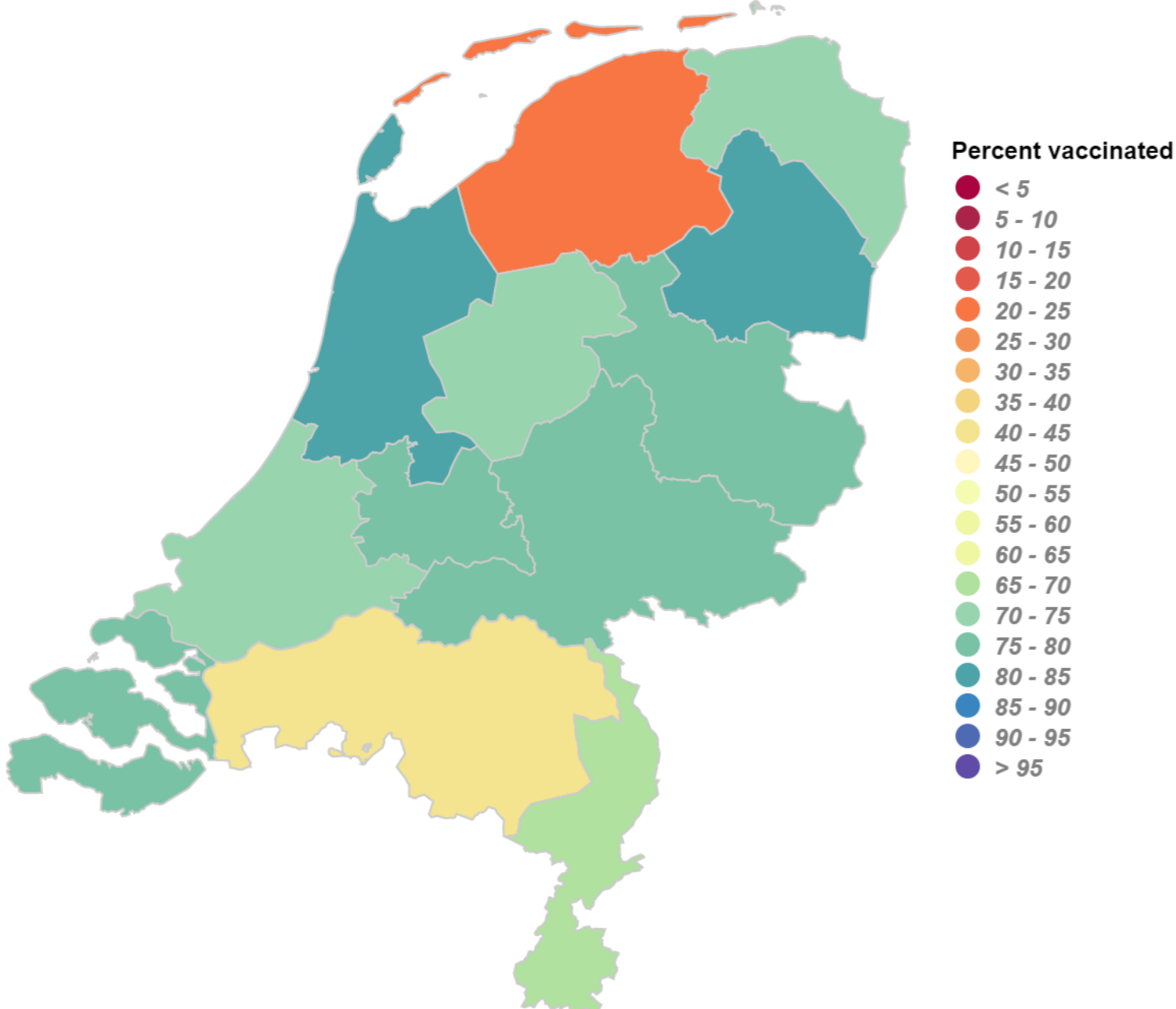


Regional MCV dose 1 coverage in birth cohort 2018

Pilot platform Netherlands, birth cohort 2011, MCV dose 2

NETHERLANDS

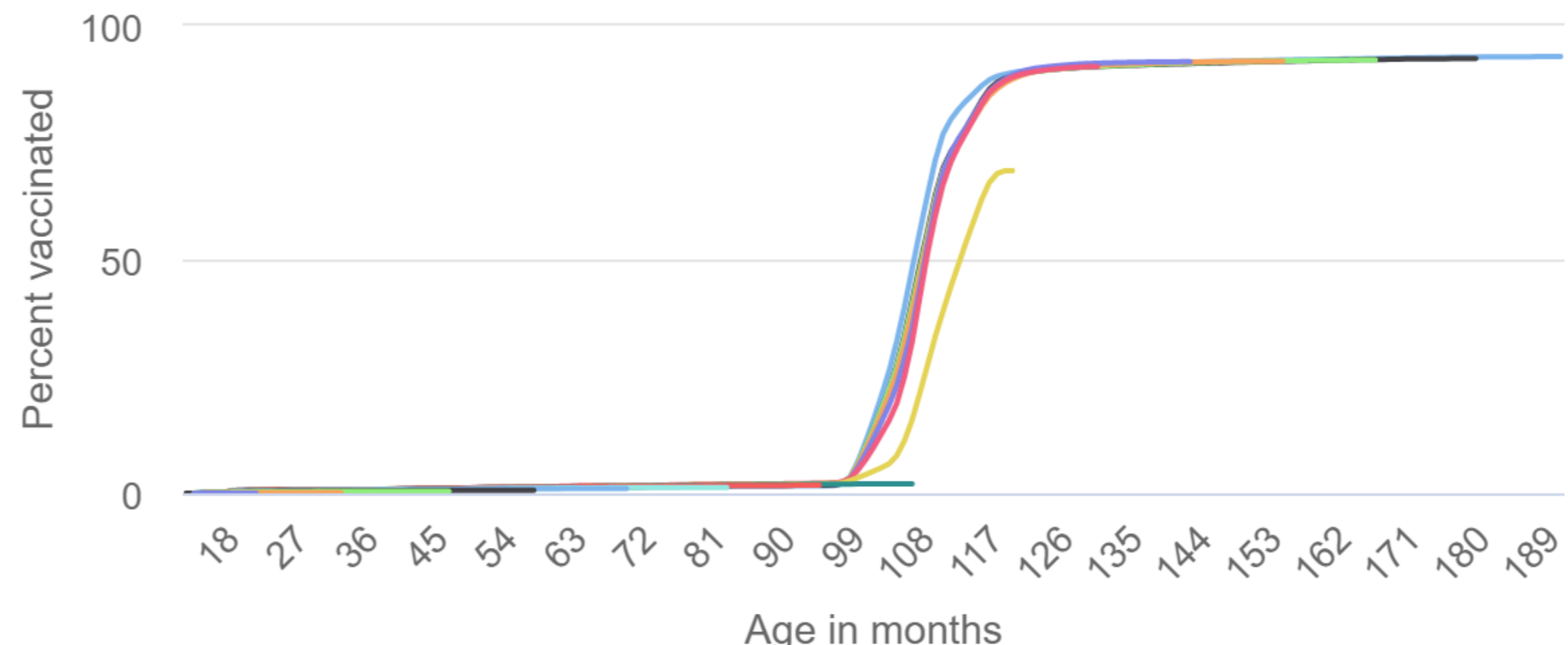
Status date: 07.12.2020



Highcharts.com

Coverage by age

Status date: 07.12.2020 Birthyear: 2005 - 2022



eu-JAV Coverage in Europe

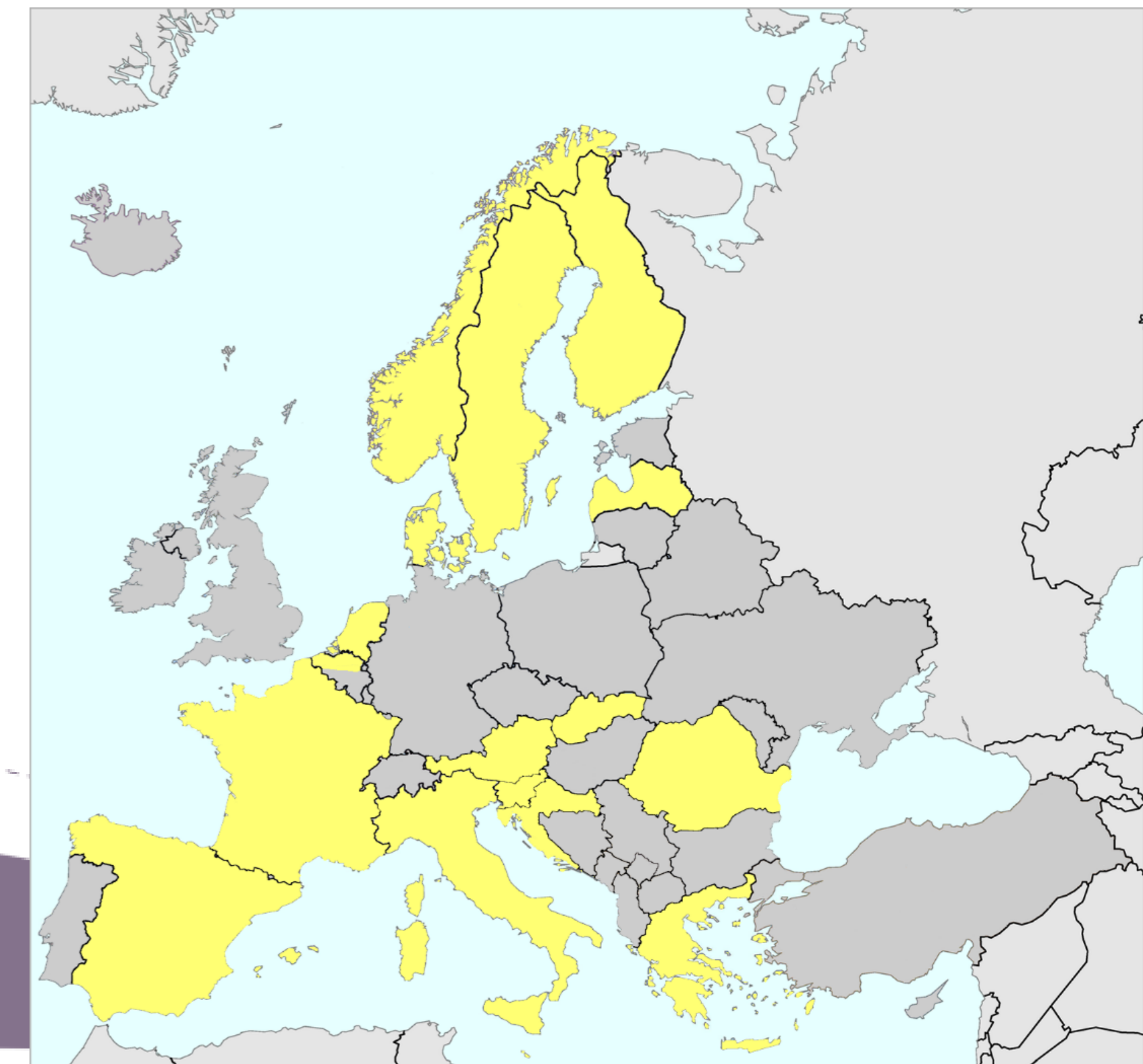


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Reminder systems in Europe

- ★ Reminder systems have been identified to improve vaccine coverage
- ★ In total, 17 countries reported that recipients of the vaccines were reminded about their vaccinations
- ★ However the extend of the reminder systems varies between countries
 - ★ From a national issue to decentralised systems run by regions, municipalities, schools, general practitioners, health care clinics, etc
 - ★ Some countries remind when the recipient is due to vaccination other remind if the recommended vaccine was not received on time.



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Ways to remind about vaccinations

★ Phone and SMS but also letters are common ways to remind parents/recipients



COVID-19 vaccination **letters** have been sent to anyone being completely unvaccinated

Well baby clinics can **call parents** if they stay away from follow-up consultations
School health service check vaccination status and can offer catch-up vaccinations

When a child is not vaccinated on time, parents receive an extra invitation by **post or by phone**

Digital reminders. Letters are only send to parents on rare occasions

Some of the municipalities do use reminder systems like **phone txt messages**. Others use tools like **web pages, regional news papers**, announcements in the major shop notice boards etc.

1.15 million people are covered by an IIS and they receive reminders by **email***

By phone, mail or sms.

Varies by Region. It is recommended that regional IIS have, as one of the minimum requirements, the possibility to send reminders via **text messages (SMS)**. Another mnumim requirement for regional IIS is the availability of a **mobile APP** for citizen services, including vaccination appointments and vaccines received.

Health care professionals send reminders to their patients usually via **SMS or by phone**

The IIS generates **notifications** if appointment has been missed by 2 months

IIS generates a **letter** to parents and a digital message to clinicians

Biyearly reports to the municipalities including unvaccinated children is the tool to follow-up on unvaccinated children

Through the IIS, clinicians are reminded to **call** their patients

Primarily by **SMS**

If the child is not vaccinated on time, parents receive an extra invitation by **post or by phone**

Mainly send by **letters, SMS and/or phone calls**

Child Health Care Centres (pre-school) and School health care contact parents about vaccinations



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Recomendations

- ★ The coverage platform is sustained for future surveillance of vaccine coverage
- ★ That European countries provide harmonised vaccine coverage estimates to the public platform
 - ★ At the EU-JAV homepage Deliverable 5.3 can be downloaded, with link to R-package, Installation guide and User guide
 - <https://eu-jav.com/achievements/>
 - <https://eujav-platform.com>
 - <https://github.com/JensXII/MCVCovLoc>
- ★ That reminder systems are further developed
 - ★ To reach subnational and cross border communities with immunity gaps or delayed vaccination