

Name: Peter Henrik Andersen

Country: Denmark

Affiliation: Infectious Disease Epidemiology and Prevention

Function: Senior Medical Officer

Main expertise (1-2 lines):

Vaccinology, Surveillance of Infectious Diseases and Vaccination Uptake. Editor of EPI-NEWS

Leading the internal medical advice team





STATENS SERUM INSTITUT

Denmark; from registers to impact: using IIS for research, reminders, and surveillance

Peter Henrik Andersen, Senior Medical Officer, Infectious Disease Epidemiology and Prevention

Conflicts of interest

- None to declare

Adult vaccination programmes (fully subsidized)

- Influenza since 1997
- Pneumococcal vaccination since April 2020 – terminated in January 2023 (HTA underway)
- Covid since December 2020
- Measles (MMR) since 2018. Not previously vaccinated or infected. One dose. Born after 1974
- Pregnant women:
- Pertussis: Temporary since November 2019, permanently since January 2024
- RSV: Seasonal program started October 2025. Discontinued end of January 2026. Restart May 2026 (still seasonal – to end of January 2026)
- (Influenza – since 2009 pandemic)
- Covid – since 2020 – discontinued 2025
- All vaccination programmes are fully publicly funded
- Some vaccines have obtained right to **conditional subsidy** for specific conditions, i.e. Shingrix and immunosuppression (applied by manufacturer, granted by Danish Health Authority)

Danish Vaccination Registry (Immunization Information System)

- Prototype developed and used during 2009 influenza pandemic (Pandemrix)
- Registration mandatory from 15 November 2015
- **All** vaccines should be registered (whether in a public programme or not)
- Childhood vaccinations from 1997 onwards imported
- Linkage between registers possible and legal via the unique personal identifier: CPR number (both for surveillance and research)
- Linkage with CPR-registry (address, ethnicity, nationality, born in/outside Denmark)
- Linkage with National Discharge Registry (so far only for project purposes – severe COPD and influenza/covid vaccination)

Childhood programme reminder scheme

- Sending out invitations to adult vaccination **builds on experiences** with Danish Childhood Reminder Scheme
- From May 2014 sending out reminders at fixed agepoints if child was **missing one or more vaccinations** according to schedule (2, 6½ and 14 years old)
- Effect of this passive system has been published in Eurosurveillance in 2017:
- Eurosurveillance | Written reminders increase vaccine coverage in Danish children - evaluation of a nationwide intervention using The Danish Vaccination Register, 2014 to 2015
- 2019 onwards change to **actively inviting** for vaccination
- Letter in parents e-boks 2 weeks prior to scheduled vaccination
- Reminder sent out six weeks after scheduled date if no vaccine is registered
- **Intelligent system:** Next invitation is adjusted for delayed previous vaccine in a series
- Effect and timeliness of this active system has been published in Vaccine in 2025:
- Effect of a proactive childhood vaccination reminder system on vaccination coverage and uptake in Denmark: A register-based cohort study - ScienceDirect

Influenza and covid vaccination

- Risk/target groups defined by Danish Health Authority
- Fully overlapping since 2023 (since 2025 no longer recommending covid to healthy pregnant women)
- Extract from CPR registry concerning age 65+
- Invitation send via e-boks (electronic letter). All residents have one.
- Prioritized for flu/covid – most elderly first
- Planned vaccination courses for all invited are automatically set up in DDV
- Appointment for vaccination from 1 October made on specific website "vacciner.dk"
- Reminder send out if no or only one vaccine is registered by start November
- Opt-out is possible
- For medical risk groups a waiver has to be filled out on "vacciner.dk" to certify that the individual belongs to a risk-group that is offered vaccination free of charge
- For pregnant women yet no invitation letter – information to GPs (SSI) and public (Danish Health Authority) about the free programmes (flu, pertussis and RSV)

Pneumococcal vaccination

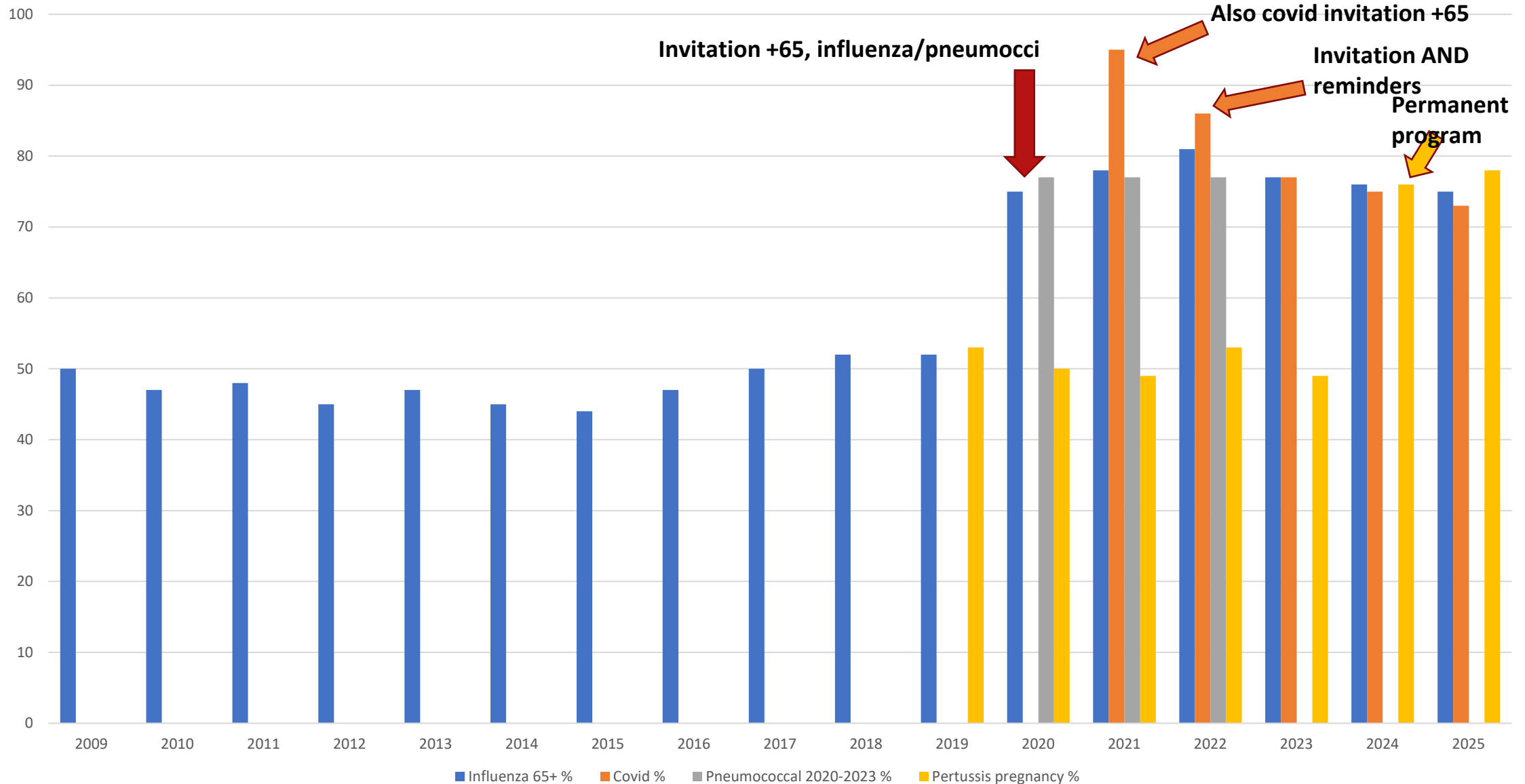
- Temporary programme started during early covid (April 2020) to reduce burden on hospitals for other infections than covid
- Pnemovax 23 used
- Invitation letter send to all 65+
- Reminder from 2022
- Riskgroups under 65 also offered vaccination, but no invitation (waiwer when booking)
- Average coverage 77% for +65 during the period April 2020 – january 2023

Coverages achieved (2025/26 season)

- Influenza and covid (overlapping risk groups, except pregnancy)
- Vaccination offered free of charge from 1 October - 20 December 2025
- Influenza vaccination coverage in 65+ and pregnancy (75%/25%)
- Covid vaccination coverage in 65+ and pregnancy (73%/15%*)
- Pneumococcal vaccination i 2020 -2023 (average 77%)
- Pertussis in pregnancy 2025 (78% **without invitation**)
- RSV in pregnancy (73% **without invitation** in first seasonal programme 1 October 2025 – 31 January 2026)

* 2024/25 season

Annual uptake of vaccination of persons +65 years for Influenza, Covid and Pneumococci plus Pertussis in Pregnancy, 2009/19/20-2025



Cohort of severe COPD patients under 65 offered influenza and covid vaccination (1)

- Use of national health registry data to identify individuals **under** 65 years at high risk of severe influenza and COVID-19 disease
- The group is offered free vaccination against the diseases but **not covered** by the age-based vaccination programme for the + 65 years of age that receive **invitation** to vaccination
- **Pilot study** aimed at assessing **acceptability** of receiving a personal vaccination invitation based on registry-based identification among individuals with **severe** chronic obstructive pulmonary disease (COPD) and to evaluate their **self-perceived risk alignment** and potential **impact on vaccination uptake**
- 3,108 persons aged 50–64 years with severe COPD and repeated hospitalizations within the past five years were identified through the Danish National Patient Registry and received a **digital invitation** recommending influenza and COVID-19 vaccination

Cohort of severe COPD patients under 65 offered influenza and covid vaccination (2)

- A follow-up anonymous questionnaire was distributed in January 2025 to 3,058 eligible individuals; 1,277 responded (**response rate: 42%**)
- Vaccination uptake was assessed using the Danish Vaccination Registry and compared with a similar population from the previous season
- **Acceptability** of invitations based on registry-based identification was **high (95%)**, with **most respondents (88%) finding them aligned with their health perception.**
- **Self-perceived risk** was substantial (**76% for influenza, 88% for COVID-19**) , and trust in data security was **high (90%)**.
- **Notably, 76% reported increased willingness to vaccinate.**
- Uptake reached 67% (influenza) and 63% (COVID-19), compared to 63% and 55% the previous year.

Cohort of severe COPD patients under 65 offered influenza and covid vaccination (3)

- The pilot demonstrates that registry-based identification and targeted invitation of individuals under 65 years with severe COPD and at risk of severe influenza and COVID-19 is **acceptable for the group and feasible to execute nationally**
- The approach has potential to improve vaccination uptake in risk populations

Other data to inform PH on differences in vaccination uptake

- Reports on **determinants for adult vaccination**:
- Differences according to **sex, age, ethnicity, country of birth, residence and comorbidity** described
- Influenza 2022/23:
 - https://www.ssi.dk/-/media/arkiv/dk/vaccination/determinantsrapporter/determinanter-for-influenzavaccination_final.pdf
- Covid 2022/23:
 - https://www.ssi.dk/-/media/arkiv/dk/vaccination/determinantsrapporter/determinanter-for-covid19vaccination_final.pdf
- Pneumococci 2020-23:
 - https://www.ssi.dk/-/media/arkiv/dk/vaccination/determinantsrapporter/determinanter-for-pneumokokvaccination_final.pdf

Conclusions

- Invitation to vaccination can lead to increased uptake
- Sending out personal reminders based on non-respondance to first invitation can further increase coverage
- Major increases can also be seen in programmes without personal invitation/reminder, maybe due to change from temporary to permanent programme (pertussis in pregnancy)
- Patients with severe COPD has high self-alignment and willingness to be invited to flu/covid-vaccination based on information from The National Discharge Registry
- Still to be seen whether individuals at increased risk will be identified through registries and invited for vaccination on a larger scale

Acknowledgements

- Thanks to my colleagues for sharing the results of the COPD feasibility study:
- **Ida** Mousten-Helms, Public Health Specialist, Ph.D., EPIET fellow
- **Louise** Hallundbæk, Public Health Specialist
- **Bolette** Søborg, Ph.D, Deputy Director, VPD



**Thank you for
your attention!**

