Register-based surveillance of **infectious diseases** and **comorbidities** in Finland

Tuija Leino
Finnish Institute for Health and Welfare

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Name: Tuija Leino

Country: Finland

Affiliation: THL

Function: Research professor

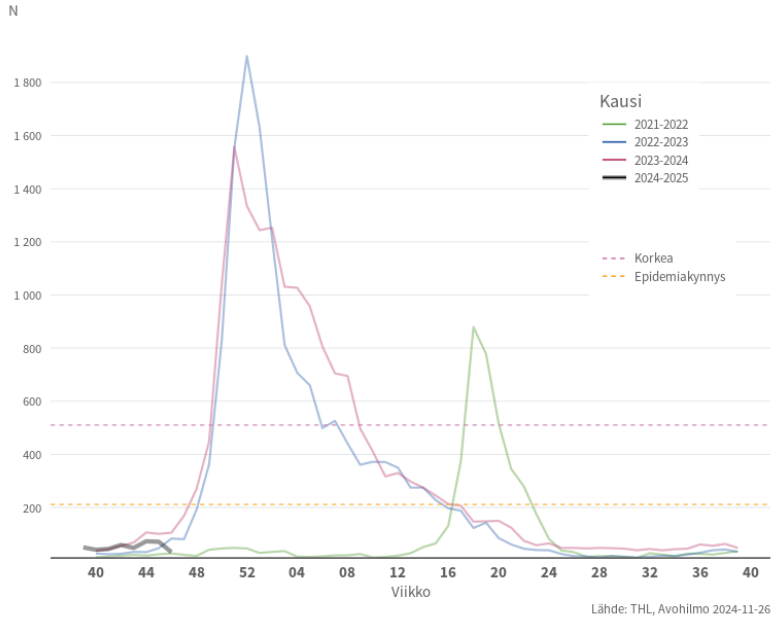
Main expertise (1-2 lines):

Register studies, surveillance, infectious disease epidemiology, vaccinations

Continuous indicator-based surveillance

Based on **laboratory confirmation**

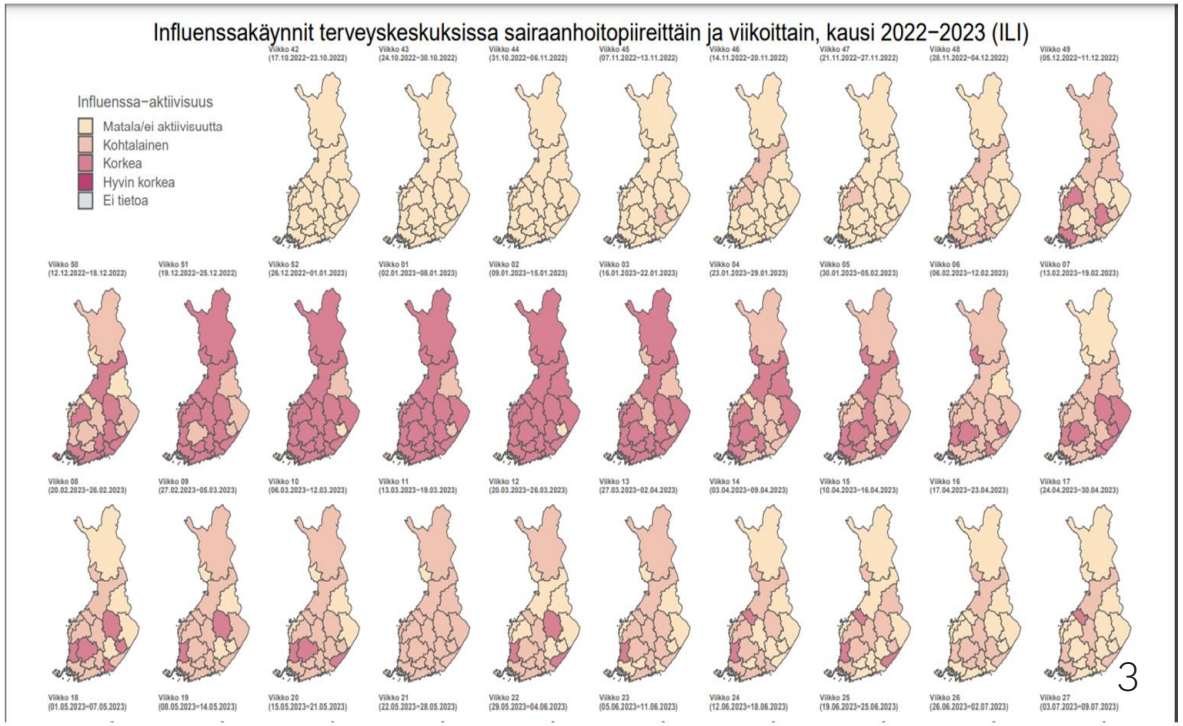
1) generally hazardous infections
2) monitored -”-
3) notifiable -”-
4) other –”-



“online”

Based on **clinical diagnoses**

- Weekly ILI (Influenza like illness) visits to primary health care



Most important registers for infectious disease and comorbidity monitoring 1/4

- **National Infectious Disease Register NIDR**

Laboratory notifications!

- Automated, algorithms can be updated
- 72 infections + B or CSF, only positive results, not all tests taken

Physician notifications

- Complementing, 32 infections
- Labour intensive, missing information and notifications,
- Aim is to limit the use in a long run

NIDR provides all laboratories an IT-program containing the comprehensive taxonomic list of microbes (N=1700), and the criteria for notifying each of them

The program selects notifiable findings (microbe, sample and test types)

- **Care register for secondary care (Hilmo)**
  - Hospitalisations and policlinic visits at secondary care
  - Timely since Covid-19 pandemic, originally a discharge register

- **Care register for primary care (Avohilmo)**
  - All primary care visits, calls etc.
  - Private sector (major operators) joined during Covid-19 pandemic

- **Intensive care register**
  - Developed originally by Intensive care consortium for monitoring quality of care

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- **Special Reimbursements Register (KELA)**
  - Codes for major diseases needing pharmaceutical treatment
  - Usable for defining risk groups for serious infections

- **ePrescription (KELA)**
  - Includes all prescriptions, deliveries, and dispensing details in pharmacies from 2017 onwards
  - Can be used to define risk groups such as immunosuppressed

- **Patient data repository KANTA ptv (KELA)**
  - All patient file information

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KELA: Social Insurance Institution of Finland

- **Cause of Death Register (Statistics Finland)**
  - Long delay currently, verification of death certificates at THL, aim is to shorten the delay
- **Population Register (Digital and population data services agency)**
  - Regularly linked to THL's registers
  - Place of residence, date of death, country of birth, most recent nationality etc.
- **Finnish Cancer registry (Finnish Cancer Society/THL)**
  - Diagnosed cancer cases since 1953, treatment, etc.
  - long delay

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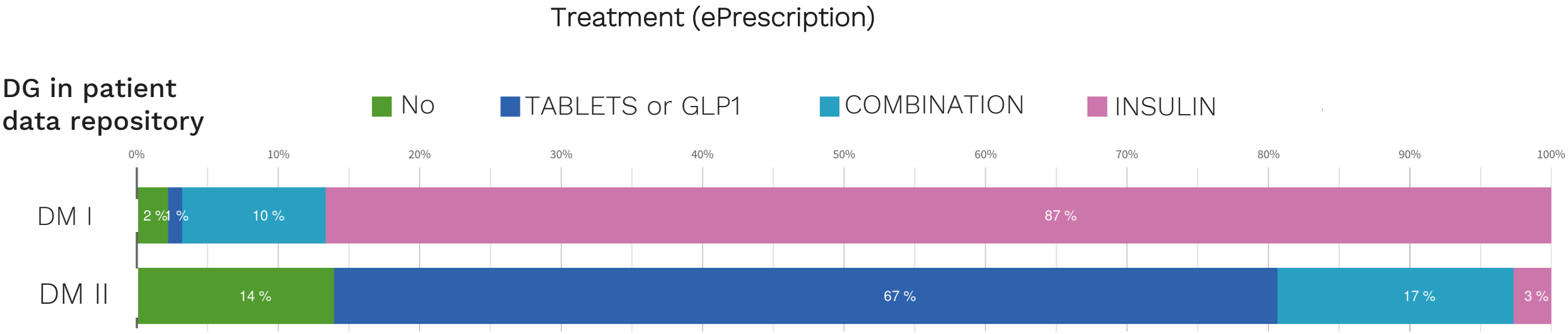
For comorbidities register linkages are important

Defining the risk groups with register linkages
Case Diabetes https://repo.thl.fi/sites/nqrdm/viimeisin/



Surveillance of health care-associated infections (HAI) and antimicrobial resistance (AMR)

HAI register SIRO

Includes components such as

- Nosocomial blood-borne infections
- Postoperative infections
- Clostridioides difficile infections

- Repeated prevalence studies
- Resource surveys

→ **Aim** is to use increasingly register linkages instead of manual notifications

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Surveillance of healthcare-associated infections - THL

FiRe - Finnish Study-Group for AMR

- Presently data on resistant microbes are collected without an individual identifier

→**Aim** is to collect AMR information in the laboratory notification to NIDR

- Information on antimicrobial usage collected on a county level

→**Aim** is to use increasingly ePrescription database (outpatient use)

Surveillance of antimicrobial resistance - THL

Mostly several registers are utilised

for example,

Infectious disease register

- Present infection

ePrescription

- Medications used to define comorbidities (insulin etc.)
- Antimicrobial used

Care registers

- Disease burden
- Comorbidities
- Hospitalisation (for HAI)

All linkable with the personal identifier

Register linkages – know how

- For all the registers to be linked, **definitions/ algorithms important**

  What is a hospitalisation caused by Covid-19?

  Should all cases have lab verification? When?

  Which is a new episode of disease?

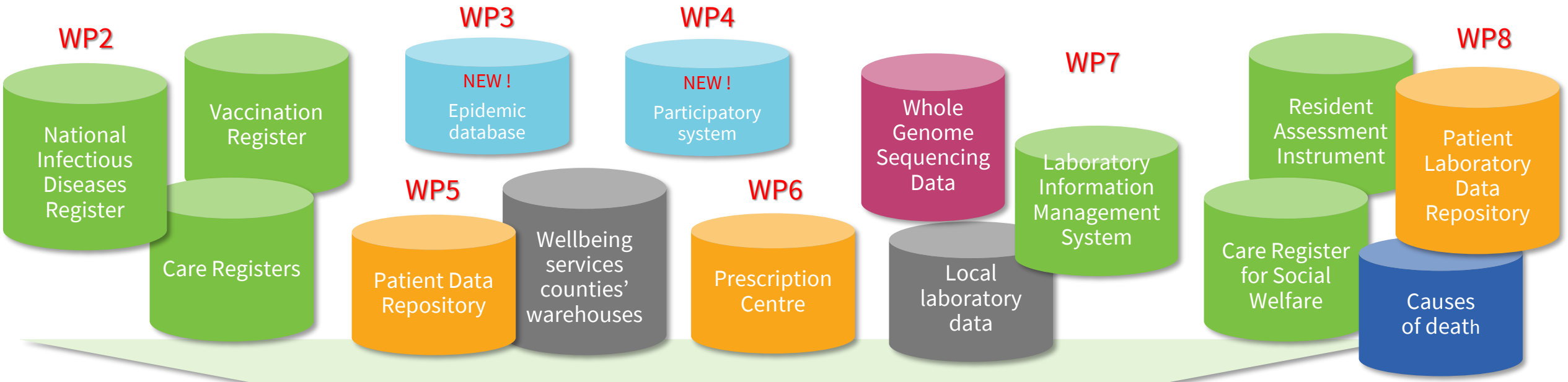
  What is a visit due to chronic hepatitis B (if using also alcohol)?

  How to consider secondary diagnoses?

  What to do with discrepancies?

Future – coming years?

Data controller: Finnish Institute for Health and Welfare (THL); Social Insurance Institution (KELA); Finnish Food Authority; Statistics Finland; Others



FinSurveillance 2025-2028: comprehensive & resilient information management system for infectious diseases surveillance

Automated data processing, Register data linking, Patient file harvesting (AI)…

- **Economic evaluations**
- **Better data to ECDC/EU/WHO**
- **Better pandemic preparedness**
- **More reliable modelling and risk assessment**
- **Harvesting healthcare-acquired infections (HAI)**
- **Identification of risk groups/ target groups**
- **Antimicrobial indications, prevalence of resistance**

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To summarise

- Rather automated digital **laboratory notifications** are the basis→ additional information can be linked to these with the unique identifier

Aiming

- to be able to monitor – **not only the incidence of infections** – but their clinical severity, health care resource use, risk factors for serious diseases and effectiveness and safety of interventions such as vaccinations
- **to cease the manual entry** → obtaining the necessary information by register linkages and AI tools etc
- **to improve the ability to monitor antimicrobial resistance (AMR) and antimicrobial consumption**, by secondary use of health care data, for more effective treatment and adequate targeting of wide spectrum antimicrobials (antimicrobial stewardship).
- **to improve the patient safety** by increasing the use of register information and other data sources on monitoring various **healthcare acquired infections (HAI)** in hospitals wards, intensive care, and long-term care facilities

Kiitos!

In the background document: With which European expert networks do you work?

- European Antimicrobial Resistance Surveillance Network (EARS-Net)
- European Surveillance of Antimicrobial Consumption Network (ESAC-Net)
- Healthcare-associated Infections Surveillance Network (HAI-Net)
- European monitoring of excess mortality for public health action (EuroMOMO)
- ECDC National Focal point networks for surveillance, for respiratory virus surveillance, etc
- European Respiratory Diseases Forecasting Hub (RESPICAST)
- Numerous joint actions etc