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Cross regional IIS mapping and data tools for vaccination coverage and programme performance





Optimising Adult Pneumococcal Vaccination

Leveraging IIS architecture for smarter pathway design
Applied vaccination data intelligence for records, recall and uptake

AIB Technical Meeting 2026

Vaccine records and recall systems in Europe to strengthen adult vaccination

University of Antwerp, 7-8 May 2026

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Cross-regional IIS mapping and data tools for vaccination
coverage and programme performance



Conflict of-Interest Statement

Financial relationship

As R&D Head at OpenSky Data Systems, I have led research work on Electronic Vaccination Registers, vaccine coverage monitoring, and adult pneumococcal vaccination analysis. Parts of this research, and subsequent applied tool development informed by it, were commissioned and/or financially supported by MSD.

Independence of interpretation

The interpretation, synthesis and conclusions presented here reflect my own professional analysis. They do not necessarily represent the views of MSD, OpenSky Data Systems, or any other organisation referenced in the presentation.

Why this Topic Matters for the AIB Meeting

Adult vaccination records and recall systems are only useful if they support the full pathway from eligibility to follow-up.

AIB focus

Strengthening adult vaccination records, reminder / recall systems, data completeness, interoperability, governance and use.

Pneumococcal test case

Adult pneumococcal vaccination exposes the same pathway weakness seen across several adult immunisation programmes.

OpenSky perspective

Applied technology and health-data intelligence: translating IIS structures into operational insight for uptake and monitoring.

How can IIS architecture help move adult pneumococcal vaccination from opportunistic activity to structured pathway management?

Core Thesis and Evidence Base

The presentation is an applied systems perspective, not a clinical guideline presentation.

Applied R&D evidence base

- Mapping IIS maturity across Europe, APAC and LATAM
- In-depth analysis of mature European IIS settings
- Comparative analysis of adult pneumococcal vaccination systems in Europe
- Development of analytical tools for visibility, interpretation and use of vaccination data

What this presentation contributes

- A pathway view of where adult pneumococcal vaccination breaks down
- A systems explanation for why recall and follow-up are hard to operationalise
- A practical bridge from data infrastructure to smarter programme design

Thesis

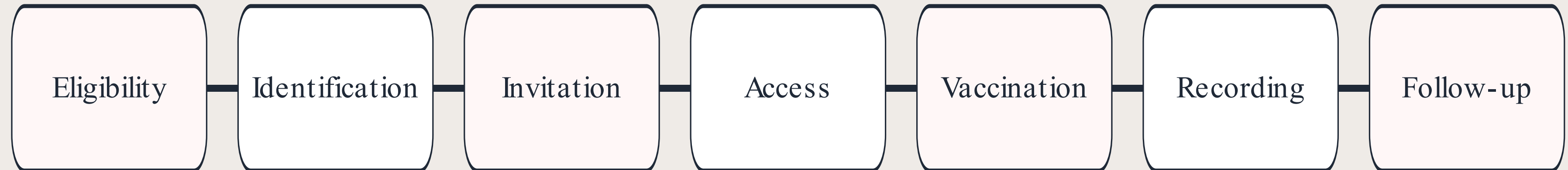
Optimising adult pneumococcal vaccination is not only a disease-specific challenge. It is a recurring programme-level challenge linked to how IIS function in practice.

This work has been informed by research collaboration and expert exchanges involving:



Adult Pneumococcal Vaccination as a Pathway

The issue is not a single step; it is the continuity between steps.



Adult pneumococcal vaccination is particularly demanding because eligibility and delivery are dispersed.

Eligibility is mixed

Age-based and risk-based criteria mean the target population is harder to define than a school-age cohort.

Delivery is multi-site

GPs, hospitals, pharmacies and other providers may all contribute to vaccination activity.

Follow-up is longitudinal

The system needs to know who remains unvaccinated, who has been reached, and when further action is needed.

Where the Pathway Weakens in Practice

The earliest stages determine whether recall and outreach can happen at all.

Typical weakening points

Eligible adults are not consistently identified

1. Invitation and recall are weak, absent or inconsistently triggered
2. Vaccination often depends on chance encounters with the health system
3. Recording may not create a reliable basis for follow-up
4. Missed opportunities are rarely recovered systematically

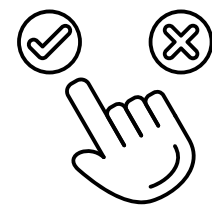
Resulting operational pattern

A fragmented, inconsistent and largely opportunistic pathway.

The clinical recommendation may exist, but the system does not reliably convert that recommendation into identification, invitation, vaccination and follow-up.

What IIS Should Make Visible

Good records are not only repositories; they are the infrastructure for pathway management.



Who is eligible

Population denominator and eligibility logic



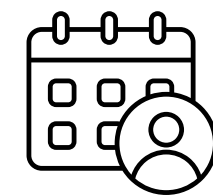
Who is vaccinated

Reliable individual and aggregate status



Where and when vaccination occurred

Provider, setting and timing



Whether follow-up is needed

Recall, missed opportunities and next action

When these are visible together, IIS can support targeted outreach, pathway monitoring, recall and more consistent programme action.

This is where health-data infrastructure becomes vaccination intelligence.

What We Observe in Practice

The core problem is an incomplete, delayed and fragmented view of adult vaccination activity.

Incomplete information

Eligibility, vaccination status and provider activity are not consistently captured across all relevant settings.

Fragmented systems

Adult vaccination data may sit across multiple provider, programme or administrative systems with only partial connectivity.

Limited timeliness

Data may not be available quickly enough to support recall, targeted intervention or real-time monitoring.

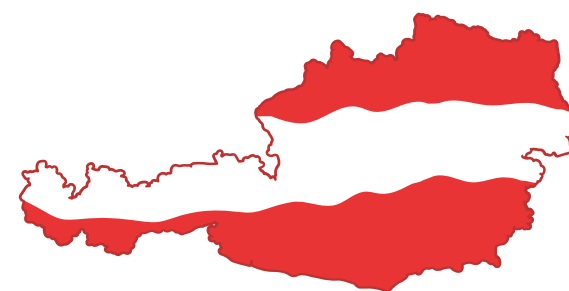
Consequence: The pathway cannot be reliably tracked from eligibility to vaccination and follow-up.

Different Country Settings, Similar Limitations

Country architecture differs, but the operational pattern is recognisable.

Austria

Fragmented registries and opt-out dynamics can limit completeness.



Poland

Limited access to patient records can constrain systematic targeting.



Netherlands

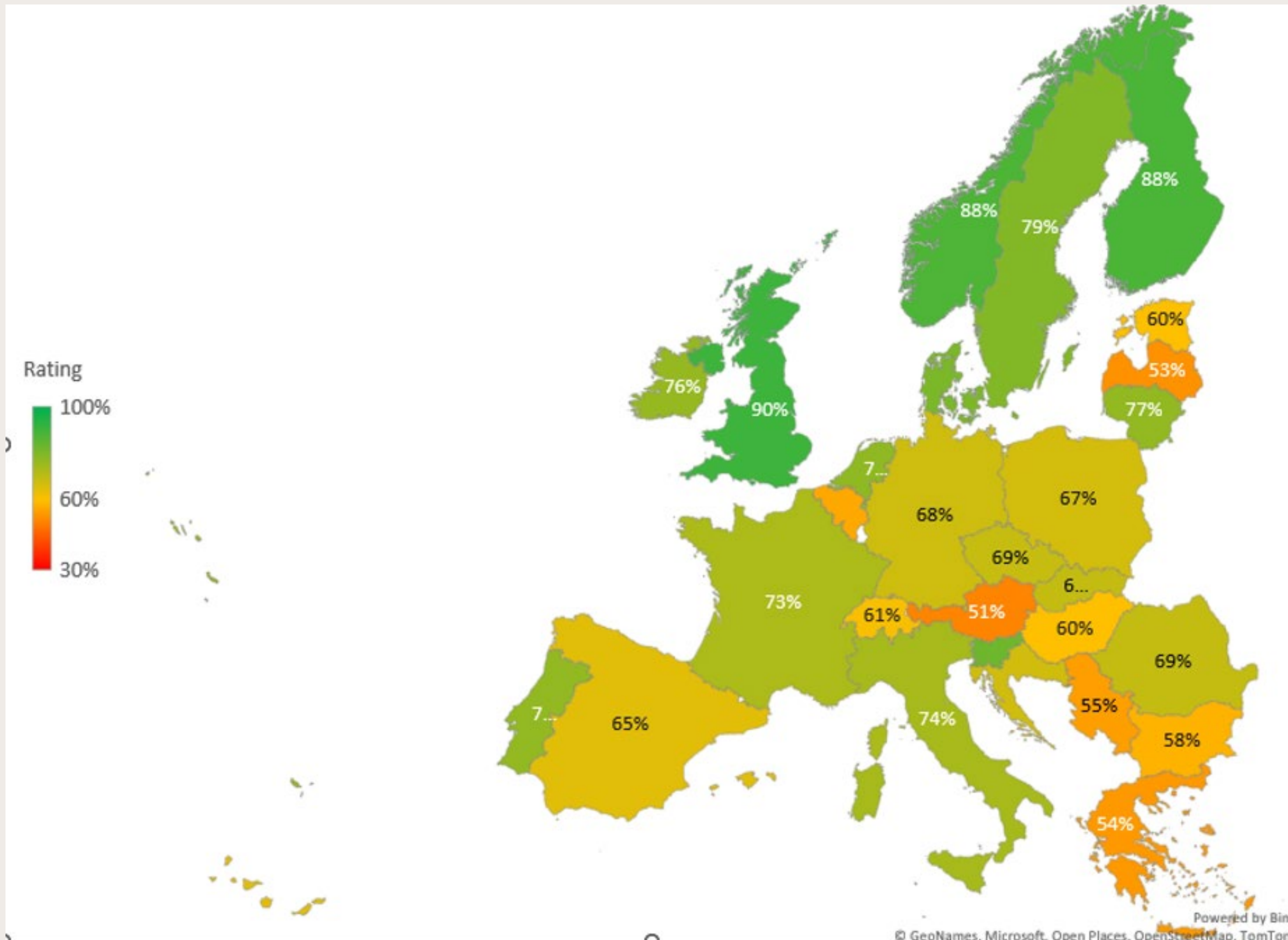
Publication delays can reduce the value of data for near-term intervention.



Belgium

Partial system coverage can create inconsistent visibility.





- Registry architecture
- Interoperability level
- Data-capture timeliness
- VCR-publication frequency
- Institutional ownership
- Pharmacy administration
- Eligibility recommendation
- Patient financial impact
- Funding source
- Serotype-data availability

Adult Pneumococcal IIS maturity across Europe

What This Means for Recall and Pathway Continuity

Reminder and recall systems depend on the same data chain that adult pneumococcal vaccination often lacks.

If the system cannot...

- identify eligible adults reliably
- know who has already been vaccinated
- connect vaccination activity across providers
- detect missed opportunities quickly



...then it cannot reliably

- generate targeted invitations
- trigger recall and follow-up
- support provider-level intervention
- monitor uptake and equity in a timely way

The limitation is not only data collection. It is the ability to turn records into pathway action — the central OpenSky lens on vaccine uptake intelligence.

Is This Specific to Pneumococcal Vaccination?

HPV provides a useful IIS stress test because it makes pathway weaknesses highly visible.

Observed problem

Adult pneumococcal vaccination shows fragmented identification, invitation, recording and follow-up.

Comparator

HPV vaccination requires cohort identification, coordination across settings and timely capture of completion status.

Insight

The same structural limitations appear when systems must identify, reach and follow specific populations over time.

Therefore, the pneumococcal challenge should be read as a programme level systems issue, not only as a diseasespecific uptake issue.

Systemic Pattern Across Regions

Across Europe, APAC and LATAM, the same IIS constraints recur in different configurations.

Recurring constraints

- Fragmented IIS landscapes
- Incomplete or delayed data capture
- Limited interoperability between systems and providers
- A gap between data collection and operational use

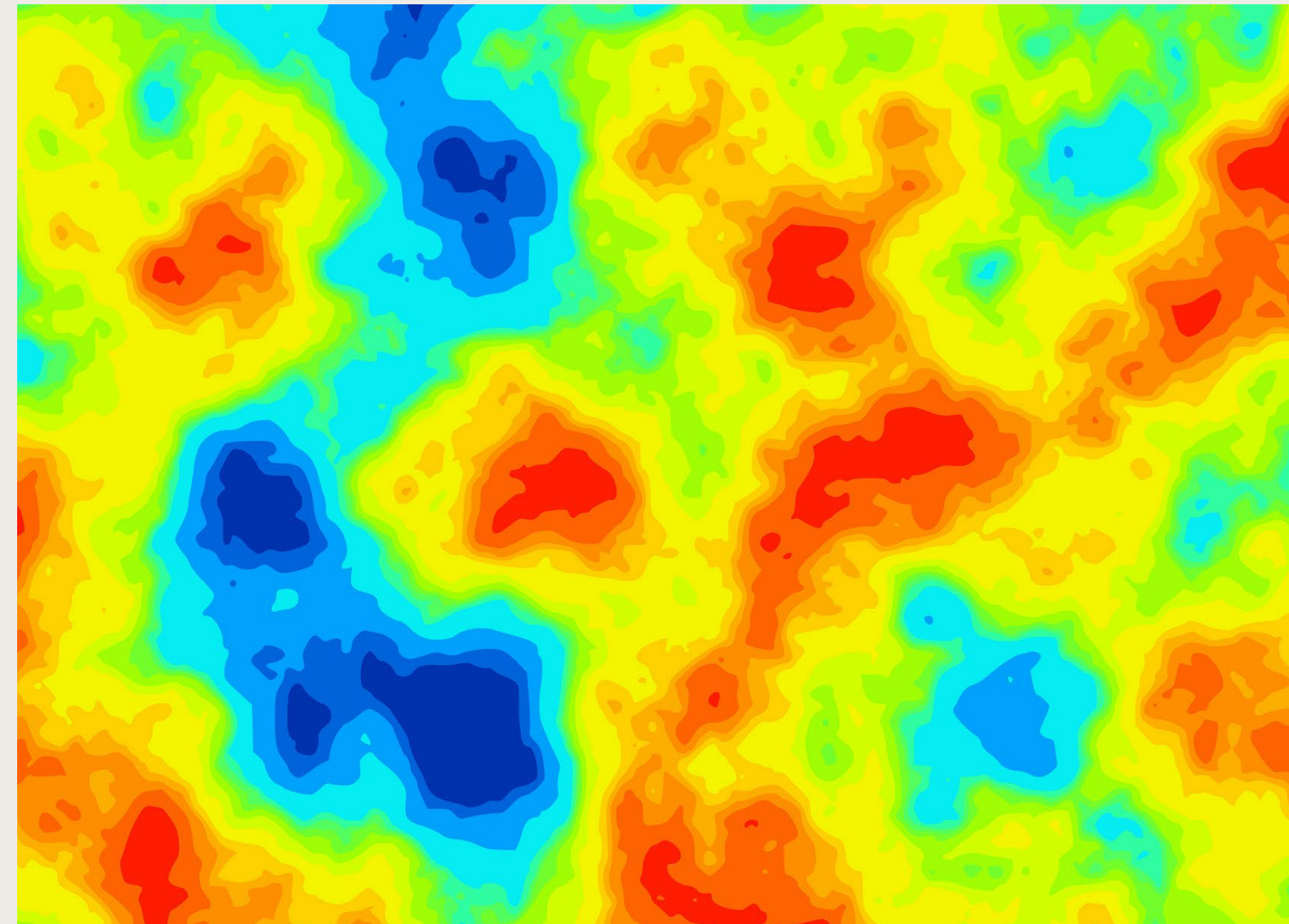
Common operational consequences

Populations are harder to identify

Data are harder to connect across providers

Uptake patterns are harder to interpret

Targeted action is harder to execute



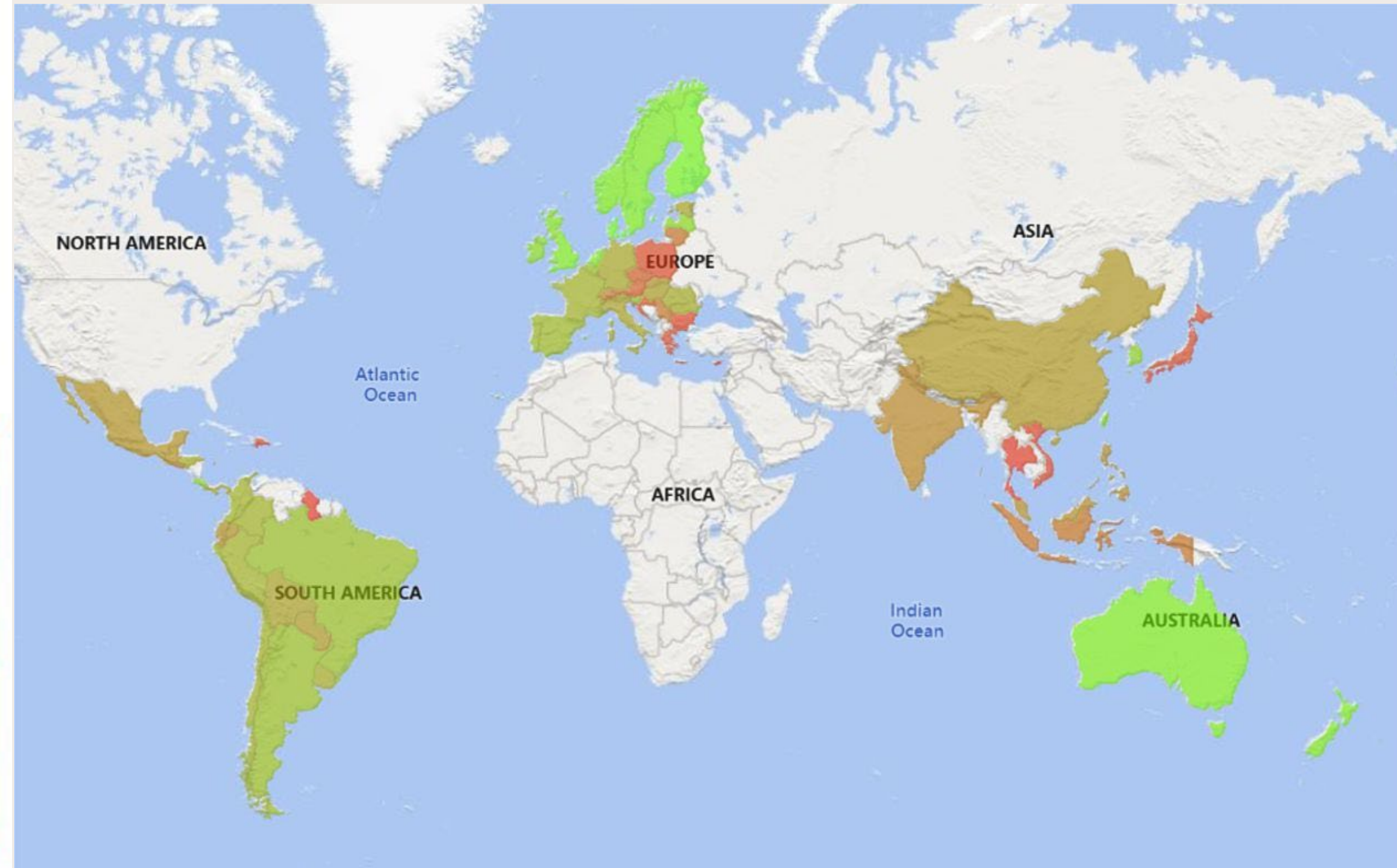
Global comparison of HPV IIS maturity

Europe | APAC | LATAM



Denmark	100%
Finland	97%
England	94%
Sweden	94%
Australia	94%
Netherlands	94%
Norway	94%
New Zealand	93%
Wales	92%
Scotland	90%
Northern Ireland	88%
Latvia	87%
Ireland	87%
Taiwan	87%
Costa Rica	86%
South Korea	84%
Malta	84%
Singapore	83%
Slovenia	80%
Hong Kong SAR	78%
Argentina	77%
Brazil	77%
Belgium	75%
Spain	75%
Portugal	75%
France	72%
Peru	72%
Chile	72%
Colombia	72%
Romania	70%
Honduras	70%
Uruguay	70%
Germany	68%
Estonia	67%

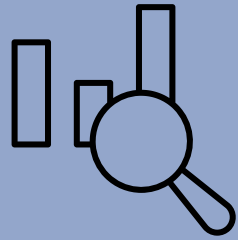
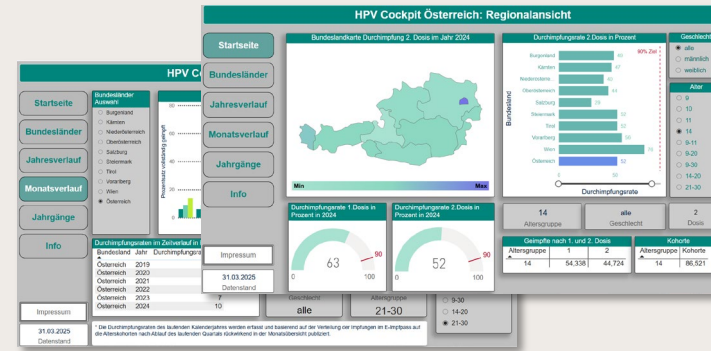
Bolivia	67%
Panama	67%
Italy	66%
Hungary	65%
Paraguay	64%
China	63%
Slovakia	63%
Luxembourg	62%
Guatemala	62%
Ecuador	62%
Mexico	61%
Malaysia	60%
Phillipines	58%
India	57%
Switzerland	53%
Serbia	51%
Lithuania	50%
Indonesia	50%
El Salvador	48%
Austria	44%
Czech Republic	43%
Croatia	41%
Cyprus	38%
Japan	38%
Greece	37%
Poland	37%
Dominican Republic	36%
Vietnam	35%
Bulgaria	35%
Thailand	32%
Guyana	30%




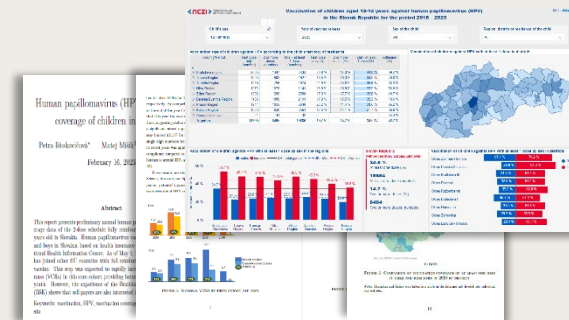
From Diagnosis to Applied Technology

Observed limitations define what smarter vaccination data tools need to support.


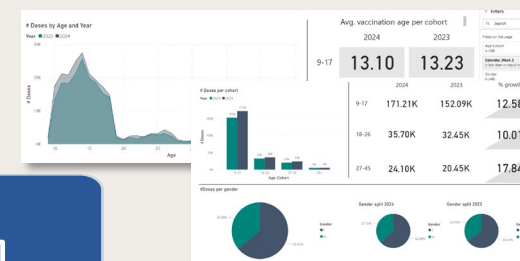
Visibility
What is happening?

Interpretation
What does it mean?

Actionability
What should happen next?

Country Dashboards 01

VCR Estimation 02

Comparative Views 03

Uptake Intelligence 04

Simulation-Ready Analytical Environments 05

OpenSky Applied
Technology Work

Applying the Approach: HPV Vaccination in Europe

The analytical approach shows how fragmented data can become operationally useful when structured and comparable.

Inputs Structured

- IIS structures across countries
- Data capture practices
- Interoperability characteristics
- Reporting frequency and completeness

Outputs Generated

- Country dashboards
- VCR estimations
- Comparative views
- Signals for monitoring and intervention

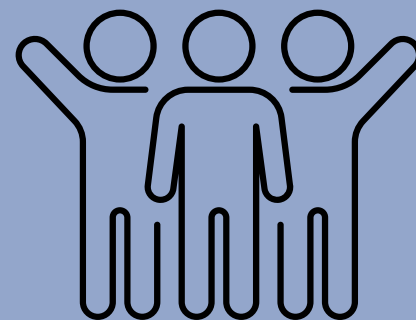
Data becomes operational when it is structured, comparable and linked to decisions. OpenSky's role is to make that link practical for vaccination uptake, monitoring and intervention planning.

Returning to adult pneumococcal vaccination

The same analytical logic can support smarter pneumococcal pathway design.

Target population

Adults are risk-based and age-based, not a single cohort.



Delivery pathway

Multiple entry points create dispersed vaccination activity.



Data challenge

Capture is less standardised and visibility across providers is weaker.



Improved Intelligence Enables



- ✓ Better identification of eligible populations
- ✓ Clearer understanding of uptake by geography, provider and risk group
- ✓ Earlier visibility of gaps and missed opportunities
- ✓ More targeted invitation, recall and follow-up

The Role of IIS in Vaccination Programmes

IIS are enabling infrastructure: they support programme decisions - they do not replace them.

IIS do not replace

Vaccination policy, eligibility criteria, funding decisions, programme design or national strategy.

IIS enable

Better visibility, coordination, monitoring, outreach, recall, follow-up and evidence-informed decisions.

From isolated programme adjustments to strengthening the data architecture that supports the vaccination pathway.

Closing Message

From opportunistic vaccination to smarter pathway design.

IIS architecture becomes a lever to:

- ✓ • identify eligible adults more reliably
- ✓ • support targeted invitation, recall and follow-up
- ✓ • connect vaccination activity across providers
- ✓ • monitor uptake and gaps more consistently
- ✓ • move adult pneumococcal vaccination from opportunistic activity to smarter pathway management

Contact Me



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