WORKSHOP REPORT

Improving surveillance and diagnostic pathways for RSV and HMPV in older adults

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Respiratory syncytial virus (RSV) and human metapneumovirus (HMPV) remain underdiagnosed and poorly accounted for within national healthcare systems across Europe, despite their substantial contribution to hospitalisation and mortality in older adults. The PREPACT project addresses this gap through a series of national workshops in France, Germany, Italy, Spain, and the United Kingdom.

1. Context and objectives

Respiratory syncytial virus (RSV) and human metapneumovirus (HMPV) are increasingly recognised as causes of morbidity and mortality in older adults[1,2] yet their epidemiological profile and burden in Italy remains incompletely specified. The evidence base is heterogeneous in both scope and methodology, and differs pronouncedly between the two pathogens.

Although RSV epidemiology in Italian adults has been amply examined across a range of clinical and surveillance settings, nationally representative time-series data on disease burden remains limited. A systematic review and meta-analysis of 35 studies conducted across Italian clinical settings between 2001 and 2023 found that 4,5% (95% CI: 3,2–5,9%) of respiratory samples tested positive for RSV, with positivity higher in older adults (4,4%) than in working-age adults (3,5%) and higher in outpatient (4,9%) than inpatient (2,9%) settings[3]. This differential by care setting likely reflects divergent testing practices, with milder presentations more frequently captured in community and primary care contexts than in hospital-based surveillance[3]. This also raises the possibility that a proportion of RSV-related deterioration in older adults is managed, and lost to surveillance, entirely within primary care. In-hospital mortality among RSV-positive adults reached a pooled estimate of 7,2% (95% CI: 4,7–10,3%), with the burden concentrated in older age groups and those with underlying comorbidities[3].

These positivity and mortality estimates, however, are obtained from studies that test only symptomatic individuals presenting to clinical services and are therefore likely to represent a lower bound on true burden. Modelling approaches, which infer RSV-attributable outcomes from population-level data without relying on diagnostic testing, consistently produce higher and arguably more complete estimates[4,5]. This indicates that burden assessments restricted to respiratory diagnoses systematically underestimate the true clinical impact of RSV.

In contrast to RSV, a nationwide, multi-year, and age-specific estimate of the disease burden attributable to HMPV in Italy cannot currently be constructed; the pathogen remains comparatively understudied, and the available evidence appears notably sparser. The epidemiology of HMPV in Italy must therefore be articulated through patterns of circulation rather than absolute burden estimates. A multicentre cross-sectional study aggregating molecular diagnostic data from 17 laboratories across Italy between September 2022 and August 2024 – encompassing over 96.000 respiratory samples – Identified an overall HMPV positivity rate of 3,4%, with clear seasonal peaks recorded in February 2023 and April 2024[6]. The 7-week shift in peak timing between the two seasons highlights the limitations of any single-season estimate as a basis for burden assessment[6]. One third of all HMPV-positive cases occurred in individuals aged over 80 years, with the proportion rising progressively across successive age strata — from 18.4% in those aged 50–60 years to 33,2% in those aged over 80[6]. This pattern should not be reduced to exposure differences, but is more plausibly attributable to the progressive immunosenescence and comorbidity burden present in the oldest age groups.

Against this uneven evidential backdrop, the PREPACT workshop series aims to (i) analyse the diagnostic and surveillance processes for RSV and HMPV in older adults as they operate in routine

practice; (ii) identify the principal bottlenecks limiting epidemiological visibility and clinical response; (iii) assess coordination across primary care, hospital, regional, and national levels; and (iv) contrast field experience with the existing research and policy evidence base.

2. Workshop design

The workshop was structured as a discussion around two sessions. The first treated diagnostic testing practices, while the second addressed surveillance information flows and cross-level integration.

The day opened with a presentation drawing upon population-scale epidemiological modelling, surveillance data, and a schematic review of the Italian diagnostic pathway from primary care through to hospital discharge. A closing session invited participants to examine the day's findings against a set of conclusions derived from prior EHMA research on RSV and HMPV across Europe, enabling triangulation of field experience against the existing evidence base.

Participants were selected with the aim of covering all relevant angles of the care continuum and health system administration, from community pharmacy through to hospital medicine, laboratory science, regional governance, and public health institutions.

3. Thematic discussion

3.1 Session I – Testing and diagnostic mechanisms

3.1.1 Current practice

- The initial point of contact occurs predominantly in primary care, where non-specific symptom onset is typically managed in the absence of routine virological testing.
- Professionals from ambulatory settings reported that respiratory infections manifest in recurrent waves, with diagnostic ascertainment characterised as limited.
- Clinical management was described as largely empirical, with antibiotic prescribing often initiated in the absence of confirmed aetiology.
- A distinction was drawn between testing mechanisms intended to inform patient management and those undertaken for epidemiological purposes, with the latter not an established feature of current practice.
- RSV was described as receiving greater attention than HMPV, a pattern attributed to variation in clinical awareness and to the composition of available diagnostic panels.
- Within acute care, diagnostic testing was described as contingent upon admission status, with advanced diagnostics including multiplex PCR typically reserved for patients requiring hospitalisation.
- Patients commonly present to emergency departments following an initial period of community-based management, often with antibiotic treatment already initiated.
- Test utilisation was found to vary with the availability of treatment options linked to a positive result. Where testing informs an immediate therapeutic decision (i.e. distinct clinical action pathway) such as antiviral initiation, uptake is higher. Conversely, where preventive strategies such as vaccination remain underdeveloped or inexistent, the incentive to pursue virological confirmation remains correspondingly reduced.

3.1.2 Bottlenecks and challenges

- The absence of early diagnostic forecloses any meaningful distinction between viral and bacterial infection, with reported implications for therapeutic appropriateness and antibiotic stewardship.
- The identification of the causative agent was described as relevant not merely for individual case management but also for broader monitoring and interpretation of clinical trajectories. The case of overlapping attribution in bronchiolitis was cited to evidence this divergence, with presentations so far categorised as non-RSV being increasingly ascribed to HMPV upon molecular screening.
- A laboratory-based approach to all suspected respiratory cases was regarded as operationally and economically non-sustainable.
- Diagnostic yield depends on appropriate alignment between clinical suspicion and test selection. Broader syndromic panels were understood to increase the probability of pathogen identification, although associated with higher costs, while lower-cost alternatives can introduce structural blind spots in detection.
- The temporal dimension of testing was consistently identified as a predominant weakness, with laboratory turnaround times extending up to one week and results becoming available after clinical management decisions have been taken. Under these conditions, testing assumes the character of a retrospective confirmation exercise rather than a clinically actionable tool.
- Opportunities for earlier diagnostic intervention were identified as being missed at the level of primary care and, to a lesser extent, in emergency settings.

3.1.3 Opportunities, needs and ideas

- Universal agreement on the need for point-of-care diagnostics, with consideration given to their targeted deployment during peak respiratory seasons. The experience of COVID-19 was cited as illustrative, with rapid testing enabling initiation of treatment within a short timeframe and reducing inappropriate hospital admissions.
- More explicit definition of higher-risk patient groups was identified as a potential way forward.
- Tests delivering results within a short timeframe would materially alter both clinical management and organisational processes. Early identification of viral infection was associated with more appropriate antibiotic use and with improved management of patient flows, including cohorting and exposure control within hospital environments.

- Patient awareness was put forward as a determinant of demand, with primary care physicians maintaining that patient awareness positively correlates with demand for testing, and individuals more likely to request diagnostic confirmation when they understand its clinical relevance.

3.2 Session II - Surveillance and information flows

3.2.1 Current practice

- The surveillance landscape for respiratory viruses in Italy was described as fragmented in both data generation and cross-level transmission.
- The impact of primary care to surveillance was acknowledged as central yet poorly served by existing arrangements. A general practitioner noted that patient-level data, where recorded, remain siloed to individual medical records and travel no further than the practice.
- Facility-based providers reported circumstantial clinical information available at the point of hospital admission. Acute respiratory incidents documented within the patient medical record remain equally inaccessible to primary care, evidencing a bidirectional deficit in interoperability.
- Confirmed cases consist largely of patients tested within hospital settings, which produces a selective representation of viral circulation in which milder and community-managed presentations remain unobserved, effectively missing the underlying denominator of infection.
- Current surveillance outputs capture presence and temporal trends rather than true disease burden, with substantial information loss occurring at the earliest stages of the care pathway where testing is absent or cases are not appropriately classified.
- Data transmission from regional to national level was described as equally discontinuous. Regions collect relevant data but upward transmission is not standardised, with sentinel network models remaining the prevailing approach.
- Pathogen inclusion within national surveillance frameworks was reported to turn on considerations of disease severity, transmissibility, and the availability of preventive measures.

3.2.2 Bottlenecks and challenges

- The electronic health record was put forward as the appropriate construct for supporting data continuity, though its current usage was regarded as falling short, owing to non-standardised coding and the misalignment between surveillance requirements and routine workflows.
- Sentinel network models were strongly regarded as outdated and insufficient in their representativeness.
- The absence of a consolidated national database was flagged as a fundamental gap, with data protection legislation cited as a barrier to integration. The cessation of a number of ad hoc, decentralised surveillance initiatives was referenced as a result of these difficulties.
- Heterogeneity in diagnostic practice further undermines the comparability of surveillance outputs, with differences in multiplex panel composition and regional testing strategies producing inconsistent datasets resistant to macro-level aggregation. The exclusion of certain pathogens from routine testing directly affects their visibility within surveillance frameworks.
- Expanding surveillance capacity was acknowledged to carry substantial resource implications, rendering it a strategic and political question as much as a technical one.

3.2.3 Opportunities, needs and ideas

- Models of longitudinal care management for chronic patients were invoked as enabling a higher degree of informational integration, though their application remains circumscribed to chronic patient cohorts.
- Surveillance data were advocated for their potential to inform planning processes, including vaccination strategy. Early experience with RSV immunoprophylaxis in paediatric populations was cited as demonstrating what data-informed intervention can achieve in terms of health outcomes and cost-effectiveness.
- RSV monitoring was deemed to warrant further augmentation, while for HMPV the more immediate priority lies in generating sufficient epidemiological evidence to justify formalised inclusion.
- Acknowledging that HMPV is presently included in multiplex panels only sporadically and inconsistently across settings and regions, participants explored the merits of deploying longitudinal studies involving defined primary care cohorts comprising a fixed number of general practitioners per region, with patient follow-up to build a reliable evidence base on incidence, recurrence, severity, and comorbidity patterns.
- Wastewater surveillance was portrayed as a complementary practice, capable of capturing broader patterns of viral circulation at relatively low cost, not as a replacement for clinical surveillance but as a supplementary directional source. A participant involved in regional outbreak monitoring verified that the HMPV pathogen is included and periodically discernible within the urban sewerage catchment.

4. Cross-cutting observations

- Diagnostic and surveillance arrangements are heavily oriented around acute, hospital-centred presentations, leaving the broader infection landscape in the community systematically unobserved.
- Blind spots in pathogen detection are further compounded by long testing turnaround times, uneven diagnostic panel composition across settings and non-standardised coding.
- A circular relationship exists between diagnostic incentive and surveillance investment. Where treatment pathways are underdeveloped, the clinical rationale for testing weakens; where testing is limited, the evidence base required to justify expanded surveillance, and preventive intervention cannot be built.

- The epidemiological visibility of RSV and HMPV in older adults is constrained less by the absence of clinical activity than by the absence of coordinated mechanisms to capture it.
- Participating healthcare professionals were notably aware of the financial implications of expanded testing and more frequent reporting intervals, with cost considerations featured consistently in their appraisal of what is operationally feasible.

5. Operational priorities

- The routine deployment of point-of-care diagnostics in primary care would address the diagnostic gap at the earliest stage of the care pathway, where empirical management currently prevails.
- A reduction of laboratory turnaround times to clinically actionable intervals would restore the function of testing as a decision-support tool rather than a retrospective confirmation exercise.
- The standardisation of EHR coding and the alignment of clinical workflows with surveillance requirements would enable the electronic health record to support data continuity across primary and secondary care.
- The augmentation of national surveillance for RSV is supported by an evidence base sufficient to justify formal expansion.
- Longitudinal cohort studies in primary care offer the most viable instrument for generating the epidemiological evidence required to formalise HMPV within national surveillance frameworks.

Improvements in either domain are unlikely to be achieved through discrete technical interventions, requiring instead governance decisions and resource commitments that extend well beyond the clinical settings in which the burden is most visibly concentrated.

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