



MONTANA COPD: Health trajectories before initiation of NIV for COPD, a French nationwide database analysis¹

> Context

Although COPD is the most common indication for long-term domiciliary non-invasive ventilation (NIV), there is a lack of clear recommendations on the optimal timing for NIV initiation for different COPD phenotypes. The Montana study explores COPD patients' pre-NIV trajectories to determine whether these trajectories were associated with different outcomes.¹

> Study details



Study population:

- COPD patients receiving home NIV in France during the study period, n=54,545. This is the largest cohort of COPD patients treated with NIV ever to be analysed.
- Inclusion criteria: COPD patients aged ≥40 years with ≥1 reimbursement for NIV between 1 January 2015 and 31 December 2019.
- The study population was elderly (median age 70 years) with multiple comorbidities.



Study methodology:

- Machine learning and clustering methodology were used to identify patient clusters.
- Study data was drawn from the French national health insurance reimbursement system database (SDNS), a large, unbiased, well-anonymised claims database that covers >99% of the French population and holds data on nearly 68 million individuals.



Study objectives:

Quantify and describe patients who use NIV at home in order to understand their care trajectory before NIV treatment.



Study investigators:

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 - Dr Alain Palot (Saint Joseph, Marseille – private hospital)
- With the support of ResMed and HEVA*


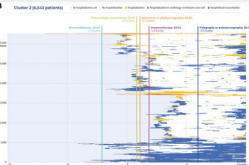

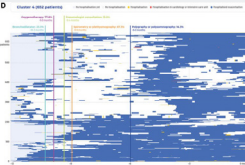
Why choose the National Health Data System (SNDS)?

The National Health Data System (SNDS) brings together the data of a population of nearly 68 million individuals. It is a valuable resource for a range of stakeholders, including industry and research and academic institutions. It enables them to conduct a wide range of studies, risk assessments, impact analyses and targeted prevention campaigns related to healthcare.

* Certified independent company approved by the Health Data Hub (HDH) and the French data privacy agency (CNIL) to carry out studies on all of the databases that make up the National Health Data System (SNDS).

> Results and interpretation

In the first phase, **four clusters of COPD patients** receiving home NIV were generated. These clusters differed in terms of age, sex, comorbidities, pre-NIV investigations and the prescriber/location of NIV initiation.

	Cluster 1	Cluster 2	Cluster 3	Cluster 4
% of cohort	66%	12%	21%	1%
Timing of NIV initiation	In ambulatory settings or after no more than one hospitalisation for severe exacerbation 	After two or more hospitalisations for severe exacerbation in the previous 6 months 	After frequent hospitalisations for severe COPD exacerbation in the previous year 	After many long-lasting hospitalisations 
Consultations and assessments	Pulmonary function tests (59.8%) Sleep assessment (25.5%) Pneumologist consultation (12.0%)	Pulmonary function tests (67.2%) Sleep assessment (25.4%) Pneumologist consultation (12.9%)	Pulmonary function tests (69.1%) Sleep assessment (25.1%) Pneumologist consultation (15.1%)	Pulmonary function tests (67.3%) Sleep assessment (14.3%) Pneumologist consultation (13.0%)
Treatment	Bronchodilators (15.3%) Oxygen therapy before NIV (42.3%)	Bronchodilators (20.2%) Oxygen therapy before NIV (59.0%)	Bronchodilators (22.4%) Oxygen therapy before NIV (63.6%)	Bronchodilators (23.3%) Oxygen therapy before NIV (77.8%)

Significant differences in mortality were seen between the patient clusters. Mortality was highest for patients who started receiving home NIV after multiple, long-lasting, severe exacerbations and lowest among patients who had NIV initiated in ambulatory settings or after their first acute event/exacerbation.

> Other perspectives

Under-diagnosis

The large number of patients in Cluster 1 who started on NIV within a few weeks of visiting a respiratory physician as well as the low rates of bronchodilator use probably indicates the high rate of under-diagnosis of COPD.

Low OSA screening

The study identified a low rate of OSA screening with polygraphy or polysomnography in the year before NIV initiation, even though current ATS guidelines recommend screening for OSA before initiating long-term NIV in stable COPD.⁵

Increasing outpatient initiation of NIV

21% of the cohort started NIV when they were clinically stable and had no previous hospitalisations, possibly with a view to improving cost effectiveness.^{2,4} Home-based initiation using telemedicine is clinically non-inferior to inpatient NIV initiation in stable hypercapnic COPD and reduces costs by more than 50%.²

Social disparities

The sickest population (Cluster 4) had delayed access to care, possibly due to geographic and socioeconomic disadvantages. Inter-professional, multidisciplinary committees must formally recognise and advocate for policies that reduce inequalities.

This content is intended for health professionals only.

1. Jean-Louis Pepin, Pauline Lemeille, Hélène Denis, Anne Josseran, Florent Lavergne, Arnaud Panes, Sébastien Bailly, Alain Palot, Arnaud Prigent, Health trajectories before initiation of non-invasive ventilation for chronic obstructive pulmonary disease: a French nationwide database analysis, The Lancet Regional Health - Europe, 2023, 100717, ISSN 2666-7762, <https://doi.org/10.1016/j.lanepe.2023.100717>.
2. Duiverman ML and al. Home initiation of chronic non-invasive ventilation in COPD patients with chronic hypercapnic respiratory failure: a randomised controlled trial. Thorax. 2020 Mar;75(3):244-252. doi: 10.1136/thoraxjnl-2019-213303.
3. Howard ME, Ridgers A. Implementing non-invasive ventilation at home: the frontier for chronic respiratory failure? Thorax. 2023 Jan;78(1):7-8. doi: 10.1136/thorax-2022-219480.
4. Murphy PB and al. Cost-effectiveness of outpatient versus inpatient non-invasive ventilation setup in obesity hypoventilation syndrome: the OPIP trial. Thorax. 2023 Jan;78(1):24-31. doi: 10.1136/thorax-2021-218497.
5. Macrea M and al. Long-Term Noninvasive Ventilation in Chronic Stable Hypercapnic Chronic Obstructive Pulmonary Disease. An Official American Thoracic Society Clinical Practice Guideline. Am J Respir Crit Care Med. 2020 Aug 15;202(4):e74-e87. doi: 10.1164/rccm.202006-2382ST.