Be-MOMO in Nursing Homes (Belgian Mortality Monitoring)

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Key points

- **Monitoring the vulnerable**

  Nursing home (NH) residents, highly susceptible to public health threats like epidemics and climate-related events, are closely tracked by Be-MOMO in NH – a dedicated, near real-time mortality surveillance launched in 2024.

- **Actionable insights**

  By monitoring all-cause mortality on a weekly basis, the system rapidly detects excess deaths, providing crucial data to assess the severity of crises and guide public health responses.

- **Sustainable surveillance**

  By relying on pre-existing data streams, the project operates without overburdening NHs or regional health authorities.

- **Risk patterns revealed**

  The system uncovered disproportionate excess mortality among NH residents during COVID-19, and identified flu, heatwaves, and cold spells as clear high-stress events for this population.

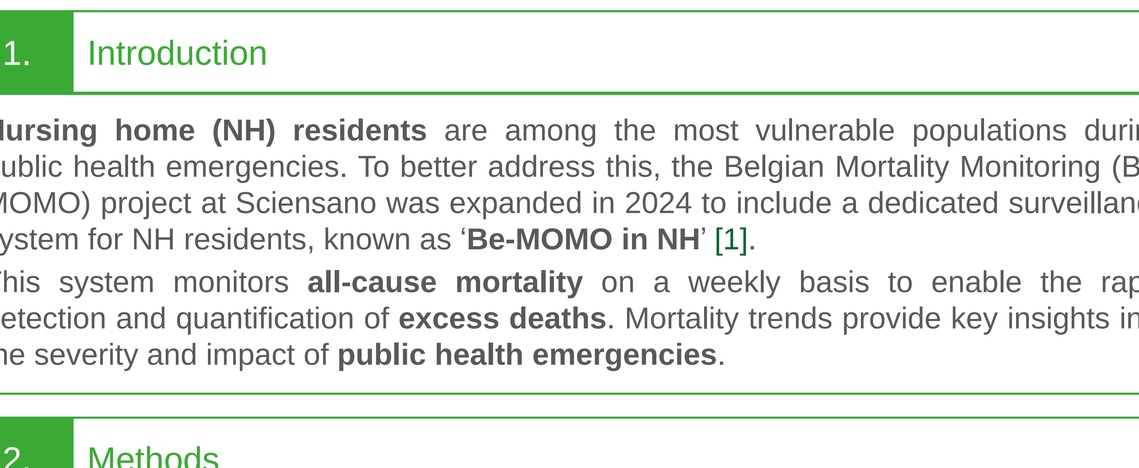
1. Introduction

Nursing home (NH) residents are among the most vulnerable populations during public health emergencies. To better address this, the Belgian Mortality Monitoring (Be-MOMO) project at Sciensano was expanded in 2024 to include a dedicated surveillance system for NH residents, known as '**Be-MOMO in NH**' [1].

This system monitors **all-cause mortality** on a weekly basis to enable the rapid detection and quantification of **excess deaths**. Mortality trends provide key insights into the severity and impact of **public health emergencies**.

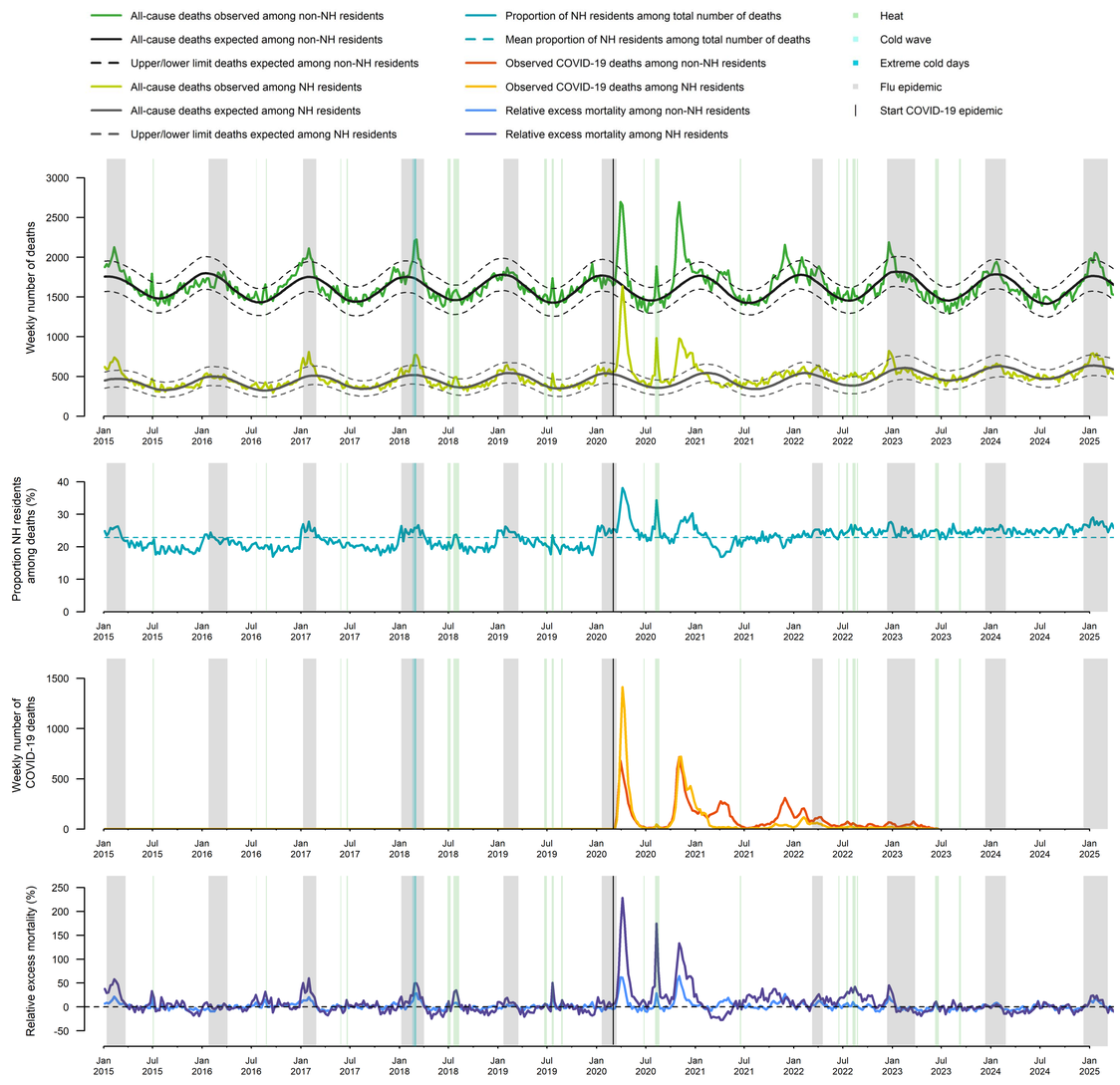
2. Methods

Data	Statbel receives mortality data from the National Register, and identifies the NH residents based on a proxy derived from the household type. NH population data is provided by the regional health authorities. Risk factors include **influenza-like illness incidence** (Sciensano), **air pollution** (IRCEL) and **temperatures** (KMI).
Model	**Expected daily/weekly deaths (baseline)** are estimated using a modified overdispersed Poisson model based on the Farrington algorithm, applied to mortality data from the previous five years (excluding the most recent two months) [2].
Subgroups	**Excess mortality** is assessed across all combinations of **region** (Belgium, Flanders, Wallonia, Brussels), **age group** (65-84 years, 85+ years), **sex** (male, female), and **population type** (NH residents vs non-NH residents).



3. Results

COVID-19	Weeks of extreme excess mortality in 2020. Highest peak: NH +228% (wave 1), non-NH +64% (waves 1 & 2).
NH proportion of deaths	Averaging 23%, with clear seasonal pattern pre-COVID-19, then disrupted and slightly elevated.
Other events	Moderate excess mortality typically occurs during heatwaves, cold spells, and flu in both groups, though discrepancies between NH and non-NH residents can arise.



4. Challenges and Next Steps

Dynamic population	**Fluctuations** in the NH population at risk (admissions, transfers, mortality) complicate accurate modelling.
Age group shifts	Relatively rapid changes in **age distribution** are not captured by the model, reducing precision in estimates and anomaly detection.
Regional variations	**Regional differences** in demographics and healthcare impact consistency.
Data accuracy	**Misclassification** occurs as 20-30% of NH residents are labeled as non-NH residents due to official domicile not being registered at the NH, potentially affecting NH vs. non-NH comparisons.
Future direction	Enhancing model accuracy by integrating **demographic data** on the NH population over time.

5. Conclusion

The Be-MOMO in NH project contributes to guiding and strengthening public health measures in Belgium by enabling near real-time surveillance of all-cause mortality in NH residents - a population highly vulnerable to public health threats like climate-related events and respiratory infections, as shown by COVID-19.

By leveraging existing data streams, the project ensures sustainable surveillance without overburdening NHs or regional health authorities. It is dedicated to improving the well-being of NH residents and advancing public health initiatives in Belgium, with future demographic data integration set to boost accuracy and impact.

REFERENCES

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[2] S. Nganda, N. Bustos Sierra, T. Braeye, C. Vernemmen. Surveillance van de mortaliteit door alle oorzaken in België, Vlaanderen, Wallonië en Brussel tijdens de zomer van 2024. Be-MOMO: the Belgian Mortality Monitoring en Be-MOMO in woonzorgcentra. Brussel, België : Sciensano ; 2025 88p. Rapportnummer: D/2025.14.440/8. https://epistat.sciensano.be/docs/momo/Be-MOMO-summer-2024-NL.pdf

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