



6.9. Patient-to-nurse ratio (A-8)

6.9.1. Documentation sheet

Description	<p><u>Main indicator</u>: Patient-to-nurse ratio on general nursing units</p> <p><u>Secondary indicator</u>: Nursing Hours per Patient Day in Acute Hospitals (NHPPD)</p>
Calculation	<p>Patient-to-nurse ratio on general nursing units</p> <p>For international comparison we report patient-to-nurse ratios. Nurse staffing was calculated based on the RN4CAST-data (survey in 12 countries, 488 hospitals, 33 659 nurses), as a ratio of patients to nurses. Nurses on general surgical and internal medicine nursing units were asked for how many patients they were responsible during their last shift. The results were averaged across all nurses providing direct inpatient care in the sampled nursing units. A new RN4CAST survey will start in 2019 in Belgium. The indicator will be updated on the website.</p> <p>Nursing Hours per Patient Day in Acute Hospitals (NHPPD)</p> <p>Numerator: the sum of the staffed hours of Registered Nurses (bachelor's degree prepared and diploma level nurses). Students are not taking into account (CAT006).</p> <p>Denominator: the number of inpatient days per nursing unit per observation day.</p> <p>The NHPPD-measure is calculated for general surgery nursing units (C) and general internal medicine units (D). It should be noted that we aim to measure the nursing staff availability (Bachelor prepared nurses and Diploma prepared nurses). However, the general feedback includes an aggregate measure including all nursing and caring staff:</p> <ul style="list-style-type: none"> • CAT001: nurses with a Master's degree • CAT002: nurses with a Bachelor's degree • CAT003: nurses with a Diploma degree • CAT004: care assistants • CAT005: Supporting staff • CAT006: Students from categories CAT001-CAT004 with a clinical placement. (Excluded from the NHPPD calculation) <p>We will therefore also report the NHPPD for the disaggregated numbers CAT001-CAT003. It should be noted that the distribution statistics are only reported for the nursing units with data available in the respective categories.</p>
Limitation	<p>Nursing Hours per Patient Day in Acute Hospitals (NHPPD): Since 2017, the registration of workforce data is not mandatory anymore. As a consequence, the indicator NHPPD will not be available anymore.</p>
Rationale	<p>Shortfalls in the nurse workforce have striking implications in light of a large and growing base of research literature demonstrating an association between nurse staffing and patient outcomes in hospitals.¹⁻³ Thus, scarce nursing resources should be allocated appropriately so that excessive workload (and its negative impact on patient outcomes) is avoided.</p>
Data source	<p>Patient-to-nurse ratio on general nursing units: RN4CAST. A new RN4CAST survey will start in 2019 in Belgium. When data will be available, the indicator will be updated on the website.</p>



Nursing Hours per Patient Day in Acute Hospitals (NHPPD): Since 1988, all Belgian acute hospitals have been obliged by law to submit to the Ministry of Public Health data about nurse staffing levels and nursing activities. Data are submitted quarterly (March, June, September and December), and these data form the basis of the Belgian Nursing Minimum Dataset (B-NMDS: MVG/RIM)⁴ Data intended for the B-NMDS are recorded during the first 15 days of March, June, September and December, during which one recording takes place every 24 hours^{cc}. Besides nursing activities, the number of hours that nursing staff work during the recording days are registered. The number of nursing staff is expressed as Nursing Hours per Patient Day (NHPPD), which is the sum of the staffed hours of Registered Nurses (bachelor's degree prepared and diploma level nurses) divided by the number of inpatient days per nursing unit per observation day. Since 2008, the B-NMDS was updated and integrated in the Belgian Hospital Discharge dataset (MZG – RHM). Since 2017, the registration of workforce data is not anymore mandatory.

International comparability

Patient-to-nurse ratio: this indicator comes from a European survey called RN4CAST from which a patient-to-nurse ratio can be calculated. In fact, in 2009-2010 a survey was conducted among 33 659 nurses working on general medical-surgical nursing units in 488 general acute care hospitals in 12 European countries (Belgium, England, Finland, Germany, Greece, Ireland, Netherlands, Norway, Poland, Spain, Sweden, and Switzerland).⁵ Nurse staffing was calculated for each hospital from the nurse surveys, as a ratio of patients to nurses on the nursing units on each nurse's last shift, averaged across all nurses providing direct inpatient care in the sampled nursing units. Lower ratios indicated more favourable staffing. Primary data for nurse staffing allows the minimisation of differences in administrative reporting methods across countries and restrict staffing measures to nurses providing direct inpatient care. A "nurse" was defined as a fully qualified professional nurse by the standards of each country. The patient-to-nurse ratio as measured by the B-NMDS cannot be compared in a reliable measure with these patient to nurse ratios.

Nursing Hours per Patient Day in Acute Hospitals (NHPPD): although it is an international used indicator, no systematically collected dataset exists.

Dimension

Quality of care

Related performance indicators

Patient to nurse ratio; Number of practising nurses per 10 000 population; Nursing graduates; Nursing student following a bachelor track

^{cc} Unless the patient shifts towards another nursing unit. In that case a new 'care period' is started (i.e. the care period is the unit of registration)



6.9.2. Results

Nursing Hours per Patient Day in Acute Hospitals (NHPPD)

NHPPD increased between 2011 and 2015 from 4.3 to 6.3 for surgical units and from 4.8 to 5.5 for internal medicine (see Table 54 and Figure 90).

From Table 54 it is clear that there is substantial variability in NHPPD across hospitals. Part of the variability can potentially be explained by differences in nursing intensity. In fact, hospitals receive (based on, a.o. the B-NMDS) extra budget for nursing staff if their nursing intensity is higher compared to other hospitals.⁶ Yet, it has been shown that after correcting for these differences a substantial variation in staffing ratios remain⁷, which is associated to variation in quality of patient care.⁸

Table 54 – NHPPD* in Belgian hospitals (2011-2015)

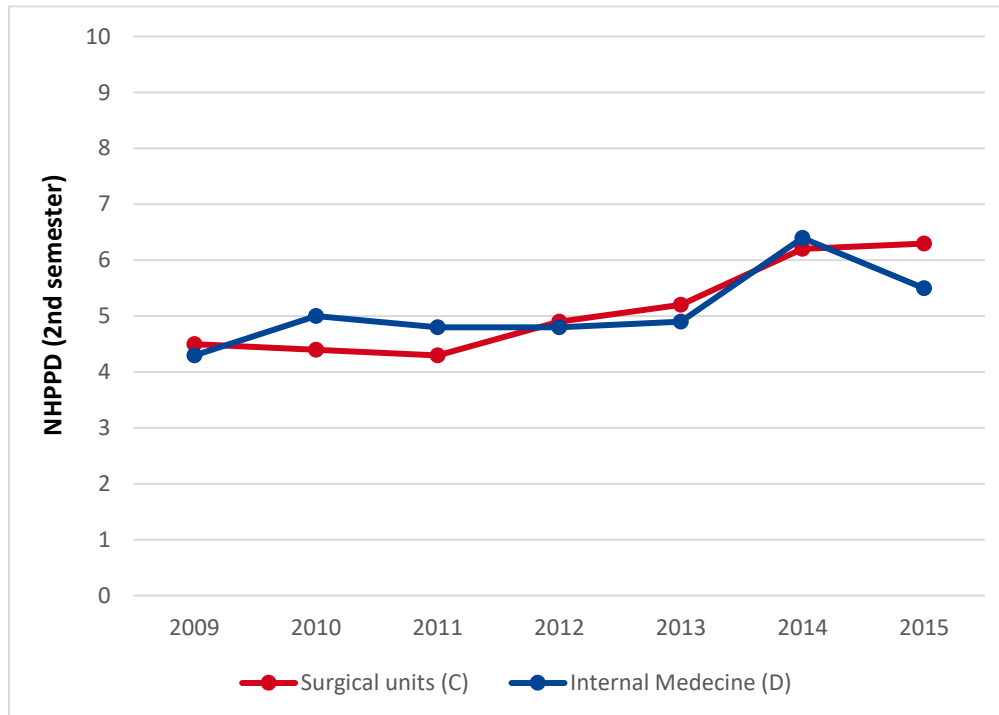
		2011 (2 nd semester)						2015 (2 nd semester)					
		P10	P25	P50	P75	P90	Mean	P10	P25	P50	P75	P90	Mean
NHPPD** aggregate measure	Surgery (C)	2.9	3.3	3.7	4.3	5.4	4.3	3.2	3.6	4.1	4.9	6.5	6.3
	Internal Medicine (D)	2.7	3.0	3.6	4.3	6.0	4.8	3.0	3.4	4.0	4.8	7.8	5.5
NHPPD*** per educational level Surgical units	Master	0.3	0.3	0.4	0.5	0.7	0.5	0.3	0.4	0.4	0.5	0.6	0.6
	Bachelor	0.9	1.2	1.6	2.3	3.0	2.1	1.2	1.6	2.1	2.7	3.7	4.0
	Diploma	0.6	0.9	1.4	1.9	2.4	1.5	0.7	1.0	1.4	1.9	2.7	1.7
NHPPD*** per educational level Internal medicine	Master	0.3	0.3	0.4	0.5	0.7	0.5	0.3	0.3	0.4	0.5	0.9	0.6
	Bachelor	0.9	1.1	1.6	2.3	3.4	2.2	1.1	1.5	2.0	2.8	5.2	3.3
	Diploma	0.6	0.9	1.2	1.7	2.2	1.8	0.6	0.9	1.3	1.8	2.5	1.7

Source: SPF-FOD Federal Public Service Health, Food Chain Safety and Environment (RHM)

Note: *NHPPD= Nursing Hours per Patient Day; ** includes hours of nursing staff (Master, Bachelor, diploma), care assistants, supporting staff and students; ***the distribution statistics only concern the nursing unit with the respective educational level present on the nursing unit.



Figure 90 – NHPPD in general surgery nursing units (C) and general internal medicine units (D) (2009-2015, 2nd semester)



Source: SPF-FOD Federal Public Service Health, Food Chain Safety and Environment (RHM)

International comparison

The average patient-to-nurse ratio in Belgium (10.7) is high compared to other EU countries (average for 12 countries: 9). The average number of patients assigned to 1 nurse is only higher in Germany (13.0) and Spain (12.6) and is nearly twice as high as in Norway (5.4). If besides registered nurses also lesser trained staff is counted the number of patients per staff member is 7.9 which is only higher in Germany.


Table 55 – Patient-to-Nurse ratios in European Hospitals: international comparison (2009-2010)

Country	Nurse staffing ratio	
	Patients to professional registered nurses	Patients to total nursing staff (registered nurses + lesser trained care personnel)
Belgium	10.7 (2.2)	7.9 (1.7)
England	8.6 (1.5)	4.8 (0.6)
Finland	8.3 (2.2)	5.3 (0.8)
Germany	13 (2.3)	10.5 (1.6)
Greece	10.2 (2.8)	6.2 (2.1)
Ireland	6.9 (1.0)	5.0 (0.8)
Netherlands	7 (0.8)	5.0 (0.7)
Norway	5.4 (1.0)	3.3 (0.5)
Poland	10.5 (1.9)	7.1 (1.4)
Spain	12.6 (1.9)	6.8 (1.0)
Sweden	7.7 (1.1)	4.2 (0.6)
Switzerland	7.9 (1.5)	5.0 (1.0)

Source: RN4CAST²



Key points

- **The number of nursing staff allocated to patient care is associated with quality of patient care. It is shown that staffing rates in Belgian hospitals are varying considerably.**
- **NHPPD increased between 2011 and 2015 from 4.3 to 6.3 for surgical units and from 4.8 to 5.5 for internal medicine**
- **In 2010, one nurse was, on average, responsible for 10.7 patients, this was amongst the highest in Europe.**

References

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