



1.1. Child and adolescent vaccination (P-1, P-2, P-3, P-12, P-14)

Description	<p>Percentage of infants who have been fully vaccinated against important infectious childhood diseases. The following coverage will be monitored: poliomyelitis (P-1), diphtheria, tetanus, pertussis (P-12), and pneumococcus (P-3).</p> <p>Percentage of infants and adolescents who have been fully vaccinated against measles (P-2) and the human papillomavirus (HPV, P-14).</p>
Calculation	<p>Diphtheria-tetanus-pertussis (DTP), poliomyelitis, pneumococcus</p> <p>Percentage of infants of 18-24 months who have been fully vaccinated for this age according to national vaccination schedules, against pertussis, diphtheria, tetanus, poliomyelitis (4 doses) or pneumococcus (3 doses).</p> <p>Measles</p> <p>Percentage of infants reaching their 2nd birthday in the given calendar year who have been fully vaccinated against measles (first dose).</p> <p>Percentage of adolescents who have received the second dose of vaccination against measles.</p> <p>Human papillomavirus (HPV)</p> <p>Percentage of adolescent girls and boys who have received a full vaccination schedule (2 or 3 doses following the age).</p>
Rationale	<p>Immunisation is one of the most powerful and cost-effective forms of primary prevention. It is a classical prevention strategy which should be maintained to ensure collective protection. Moreover, Belgium has signed the international commitment to eliminate measles, which implies a vaccination coverage of 95% for the first and the second dose of measles, and the European Vaccine Action Plan (1;2).</p> <p>The choice of the specific vaccine-preventable diseases in our indicator set is a sub-selection of the vaccination indicators from ECHIM (3) that has been updated to recent vaccination schemes.</p>
Primary Data source	<p>Regional vaccination coverage surveys are organized by the regions/communities.</p> <p>For adolescents in Wallonia and Brussels: school surveys.</p>
Indicator source	<p>For the Belgian pooled values: Sciensano (Service of Epidemiology of Infectious Diseases) (4)</p> <p>By region:</p> <ul style="list-style-type: none"> - Vaccination surveys reports: 2019 for Wallonia, 2020 for Flanders and 2019 for Brussels (5-11). - For measles coverage, school survey 2020-2021 in adolescents in Wallonia and Brussels (12-16) - For HPV coverage, school survey 2019-2020 in adolescents in Wallonia and Brussels (17)
Periodicity	<p>Vaccination coverage surveys occur every 3-4 years (5-6 years in Brussels)</p>



Technical definitions and limitations

In Belgium, vaccination is not a federal health competence and the vaccination coverage rates are measured at regional or community level. A “national” vaccination coverage rate is computed afterwards as a weighted average of the 3 regional/community rates, assuming that the rates remain constant during the inter-survey period.

Vaccination schedule: for poliomyelitis, diphtheria, tetanus and pertussis, the complete schedule in Belgium foresees 4 doses. For pneumococcus, it comprises 3 doses. For measles, the target for measles elimination is to reach 95% coverage of the 1st (at 12 months) and 2nd dose. The 2nd dose was previously given around 10-12 years in Belgium, however, since 2019 the Belgian Superior Health Council recommended administering the 2nd dose around 7-9 years (18). Coverage for the 2nd dose is not measured the same way in Flanders, Brussels and Wallonia, and is therefore difficult to compare, including the possibility of underestimation in Brussels and Wallonia. Moreover, following the change in the recommendation, the school survey in Brussels and Wallonia in 2020-2021 took place in the 2nd year of primary school instead of previously the 6th year of primary school, and probably further underestimates the coverage.

Vaccination for HPV is offered free of charge to girls and boys within the organised vaccination programme by the Communities (organised vaccination); 1st year of secondary school in Flemish Community, 2nd year of secondary school in French Community. For each programme, 2 doses are administrated with an interval of 6 months. HPV vaccination was extended to boys in 2019. Opportunistic HPV vaccination is also possible and partially reimbursed for girls and boys aged 12 to 18 years (included) by the National Institute for Health and Disability Insurance (INAMI-RIZIV). Reimbursement by INAMI-RIZIV was extended to boys by August 2022.

Note that it can be that a small percentage of infants was fully vaccinated in a country with another schedule and therefore misclassified as not fully vaccinated.

International comparability

Only full vaccination coverage by vaccine-preventable disease should be compared. National vaccination schemes differ between countries in age and the number of doses. As currently published international figures do not always display this full coverage, we do not use them and we do not present international comparison.

Targets and critical immunization rates

The critical immunisation rate (minimal level to reach herd immunity ensuring collective protection) varies according to authors (7). Based on those ranges, WHO has recommended minimal targets to reach: 90% for DTP and polio, 95 % for measles and 90% among girls for HPV (1,19). The European Vaccine Action Plan aims at ≥95% coverage with three doses of DTP (2). The Superior Health Council recommends 95% coverage for poliomyelitis (20).

Reviewers

Reviewed by:

- Laura Cornelissen, Sciensano, Scientist in Infectious diseases epidemiology
 - Tine Grammens, Sciensano, Scientist in Infectious diseases epidemiology
 - H el ene De Pauw, Sciensano, Scientist in the Cancer Center
-

**Table 1 – Critical immunization threshold and WHO immunization target rates.**

Disease	Critical threshold (7)	WHO target (1,19)	European target (2)	Belgian Superior Health Council (20)
Poliomyelitis	80-93%	90%	95%	95%
Diphtheria	80-85 %	90%	95%	
Pertussis	92-95%	90%	95%	
Pneumococcus	70%	/	/	
Measles 1 and 2	92-95%	95%	/	95%
HPV 2		90% (among girls before 15y)		

1.1.1. Results

Table 2 summarises the immunization rates for polio, DTP, pneumococcus, measles, and HPV at Belgium level. Those national rates are computed by Sciensano as a weighted average from the regional/community rates.

At national level, there is an increase in the vaccination coverage rate for polio and DTP vaccines, reaching around 94% in 2020. This level is sufficient for diphtheria, but slightly lower than the (Belgian) target for polio, and slightly lower than the critical threshold for pertussis. The national coverage is sufficient for pneumococcus.

The national coverage for the 1st dose of measles vaccination has reached the 95% target since 2012. However, the coverage for the 2nd dose of measles vaccination is too low. Completed HPV vaccination among girls under 15 years old is still too low compared to the target of 90%.

Table 3 shows regional differences in vaccination coverage in Belgium. Coverage for polio, DTP, and the 1st dose of measles is now similar in

Flanders and Wallonia but lower in Brussels. Since 2015, Wallonia has reached the 95% target for the 1st dose of measles, and Brussels is close to the target with a coverage of 94.8%. Caution should be applied when comparing regional estimates, due to different methodologies, but there are clear indications that true coverage is lower in Wallonia and Brussels than in Flanders.

1.1.2. Impact of COVID-19 pandemic

During the COVID-19 pandemic, vaccination of young children has been prioritized in Belgium, leading to very low to no impact for infants. However, school health services have been disrupted at the beginning of the pandemic and were overwhelmed with contact tracing. In Flanders, the 2nd dose of measles was prioritized and the HPV vaccination and DTP booster were later taken up by catch-up vaccination. In the French-speaking community, a decrease in vaccination was observed in 2020-2021 and 2021-2022.


Table 2 – National immunisation rates (weighted average) by disease, Belgium 2012-2020

Vaccine and dose	2012	2016	2019	2020
Surveys used for calculation of weighted average	VL 2012 RW 2012 BXL 2012	VL 2016 RW 2015 BXL 2012 RW-BXL 2015-16 for MMR2	VL 2016 WL 2019 BXL 2019 RW-BXL 2019-20 for HPV2 RW-BXL 2015-16 for MMR2	VL 2020 WL 2019 BXL 2019
Polio 4	92.0%	93.0%	93.7%	94.0%
DTP 4	91.9%	92.7%	93.3%	93.9%
Pneumococcus (PCV) 3	93.3%	93.6%	93.6%	93.8%
MMR 1	95.6%	95.7%	96.1%	96.0%
MMR 2	80.5%	82.0%	82.1%	83.0%
HPV 2 (girls)	59.0%	65.4%	66.0%	69.3%
HPV 2 (boys)	/	/	/	63.3%
HPV 2 (girls and boys)	/	/	/	66.1%

Green: reaching the critical threshold and national target; Yellow: reaching critical threshold but not national target, or very close to the critical threshold; Red: far from the target/threshold

VL = Flanders; RW = Wallonia; BXL = Brussels



Table 3 – Regional immunization rates against selected diseases by region, 2012-2020 regional vaccination surveys.

Vaccine and dose	Flanders 2012	Brussels 2012	Wallonia 2012	Flanders 2016	Brussels 2015	Wallonia 2015	Flanders 2020	Brussels 2019	Wallonia 2019
Polio 4	93.2%	91.1%	90.4%	93.6%	no new survey	92.9%	94.2%	92.8%	94.3%
DTP 4	93.0%	91.1%	90.4%	93.0%	no new survey	92.9%	94.2%	92.6%	94.0%
Pneumococcus (PCV) 3	96.5%	90.1%	89.2%	94.9%	no new survey	92.9%	95.4%	91.7%	92.0%
MMR 1	96.6%	94.1%	94.4%	96.2%	no new survey	95.6%	96.1%	94.8%	96.5%
MMR 2*	84.6%	75.5% (2008-2009)	75.5% (2008-2009)	87.4%	75.0% (2015-2016)	75.0% (2015-2016)	89.2%	51.1%** (2020-2021)	51.1%** (2020-2021)
HPV 2* (girls)	83.5%	29.2% (2012-2013)	29.2% (2012-2013)	89.5%	36.1% (2016-2017)	36.1% (2016-2017)	84.3%	50.2% (2019-2020)	50.2% (2019-2020)
HPV 2 (boys)							77.3%	45.4% (2019-2020)	45.4% (2019-2020)
HPV 2* (girls and boys)	/	/	/	/	/	/	80.7%	47.6% (2019-2020)	47.6% (2019-2020)

*the method differs by region (school survey for Wallonia and Brussels, survey in general population for Flanders)

**this study was done with another sample and methodology than the previous years in the context of changes in vaccination schedule and pandemic; results are not representative



Key points

- **It is important to develop a vaccination registry to have comparable and qualitative data from all regions**
- **Vaccination coverages are increasing. Vaccination coverage for all vaccines included in the basic infant vaccination schedule is above 90% throughout Belgium.**
- **For measles: the coverage for the second dose is too low in the 3 regions; in Flanders, it is approaching the threshold, but in Wallonia and Brussels the coverage is quite low (coverage in Brussels and Wallonia may be underestimated). An effort is still to be made to avoid measles outbreaks.**
- **For HPV: the vaccination in boys started in 2019 and had a good start. The coverage is too low in all regions, particularly in Wallonia and Brussels.**

References

1. Regional Committee for Europe. Sixtieth session. Resolution: Renewed Commitment to elimination of Measles and Rubella and prevention of congenital Rubella syndrome by 2015 and sustained support to polio-free status in the WHO European Region. Moscow: WHO Regional Office for Europe; 2010.
2. WHO European Office for Europe. European Vaccine Action Plan 2015-2020. Copenhagen: 2014.
3. Verschuuren M, Achterberg PW, Gijsen R, Harbers MM, Vijge E, Wilk EA, et al. ECHI Indicator Development and Documentation - Joint action for ECHIM final Report Part II. RIVM; 2012. Report No.: II.
4. Grammens T, Cornelissen L. Couverture vaccinale, Belgique, 2020-2021 [Internet]. Brussels: Sciensano; 2022. Available from: <https://www.sciensano.be/fr/biblio/couverture-vaccinale-des-vaccinations-de-base>
5. Robert E, Swennen B. Enquête de couverture vaccinale des enfants de 18 à 24 mois en Fédération Wallonie-Bruxelles, Bruxelles excepté, 2012. Bruxelles: Ecole de Santé Publique, ULB; 2012 Dec.
6. Robert E, Swennen B. Enquête de couverture vaccinale des enfants de 18 à 24 mois en Région de Bruxelles-Capitale, 2012. [Internet]. Bruxelles: Ecole de Santé Publique, ULB; 2012 Dec. Available from: <http://www.ccc-ggc.irisnet.be/sites/default/files/documents/graphics/rapports-externes/enquete-vaccination-2012-fr.pdf>
7. Robert E, Swennen B. Enquête de couverture vaccinale des enfants de 18 à 24 mois en Fédération Wallonie-Bruxelles (Bruxelles exceptée) 2015. ULB- PROVAC; 2016.
8. Robert E, Swennen B, Coppieters Y. Enquête de couverture vaccinale des enfants de 18 à 24 mois en Région de Bruxelles-Capitale, 2019. [Internet]. Bruxelles: Ecole de Santé Publique, ULB; 2020 [cited 2022 Oct 5]. Available from: <https://www.ccref.org/e-vax/EnqueteNourrissons2019-ResumeRapportBruxellois2020.pdf>
9. Robert E, Swennen B, Coppieters Y. Enquête de couverture vaccinale des enfants de 18 à 24 en Fédération Wallonie-Bruxelles (Bruxelles excepté), 2019. [Internet]. Bruxelles: Ecole de Santé Publique, ULB; 2020. Available



- from: <https://www.ccref.org/e-vax/EnqueteNourrissons2019-ResumeRapportWallon2020.pdf>
10. Vandermeulen C, Hoppenbrouwers K, Roelants M, Theeten H, Braeckman T, Maertens K, et al. Studie van de vaccinatiegraad in Vlaanderen, 2016. Leuven's Universitair Vaccinatie Centrum (KUL) and Centrum voor de evaluatie van Vaccinatie (UA); 2018.
 11. Maertens K, Willen L, Van Damme P, Roelants M, Guérin C, de Kroon M, et al. Studie van de vaccinatiegraad in Vlaanderen, 2020. [Internet]. Leuven's Universitair Vaccinologie Centrum, KUL, Leuven and Centrum voor de Evaluatie van Vaccinaties, UA, Antwerpen; [cited 2022 May 10]. Available from: <https://www.laatjevaccineren.be/vaccinatiegraadstudie>
 12. Van Damme P, Theeten H, Braeckman T, Lernout T, Hens N, Hoppenbrouwers K, et al. Studie van de vaccinatiegraad bij jonge kinderen en adolescenten in Vlaanderen in 2012. Centrum voor de Evaluatie van Vaccinaties, UA, Antwerpen en Dienst Jeugdgezondheidszorg, KUL, Leuven.; 2013 Jan.
 13. Vermeeren A, Miermans M, Swennen B. Évolution de 2008 à 2013 des couvertures vaccinales des enfants et jeunes en âge scolaire en Fédération Wallonie-Bruxelles. Bruxelles: Provac, ULB; 2014 Sep. Report No.: D/2014/10.134/11.
 14. Vermeeren A, Goffin F. Statistique de couverture vaccinale en 6e primaire en Fédération Wallonie-Bruxelles en 2015-2016. Bruxelles: Provac; 2016.
 15. Vermeeren A, Goffin F. Statistiques de couverture vaccinale en 2ème secondaire en Fédération Wallonie-Bruxelles en 2016-2017. Rapport. Bruxelles: Provac, ULB; 2017.
 16. Panichelli F, Sarr K, Mfueni Bikundi E, Brasseur C. Rapport de l'enquête de couverture vaccinale 2020-2021. La vaccination contre la Rougeole, la Rubéole et les Oreillons (RRO) chez les élèves de 2ème primaire dans l'enseignement de la Fédération Wallonie-Bruxelles. [Internet]. Bruxelles: FWB et ONE; 2022 [cited 2022 Dec 16]. Available from: https://www.ccref.org/e-vax/enquete_couverture_vaccinale_rro_2020_2021_resume.pdf
 17. Panichelli F, Sarr K, Brasseur C. Résumé de l'enquête de couverture vaccinale 2019-2020. La vaccination contre le papillomavirus humain (HPV) chez les élèves de 2ème secondaire dans l'enseignement de la Fédération Wallonie-Bruxelles. [Internet]. Bruxelles: FWB et ONE; 2022 Feb. Available from: https://www.ccref.org/e-vax/ResumeEnqueteCouvertureVaccinale_PSE_2019-2020.pdf
 18. Conseil Supérieur de la Santé. Avis 9606 Calendrier vaccinal de base. Bruxelles: Juin 2021. Available from: <https://www.health.belgium.be/fr/avis-9606-calendrier-vaccinal-de-base>
 19. WHO. Global strategy to accelerate the elimination of cervical cancer as a public health problem. Geneva: World Health Organisation; 2020. Available from: <https://www.who.int/publications-detail-redirect/9789240014107>
 20. Conseil Supérieur de la Santé. Guide de vaccination. Bruxelles: mai 2009. Available from: <https://www.health.belgium.be/fr/guide-de-vaccination>