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Letter to editor

Measuring meningococcal vaccination coverage among adolescents in Italy: state-of-the-art and regional challenges

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To the Editor,

Invasive meningococcal disease (IMD) is a serious infection and major public health problem, with significant health and economic burden due to high morbidity and mortality in children and young adults, as well as extensive consumption of healthcare resource and costs (1,2). The infection is sustained by the bacterium *Neisseria meningitidis*, with the majority of cases registered in children aged 0 to 4 years and in adolescents aged 15 years or older (1-3), reflecting the importance of including meningococcal vaccines in routine immunization of these subgroups (2,3). At the global level, infections are mostly due to the serogroups A, B, C,W-135, and Y (2), whereas, in Italy, serogroups B and C are the most prevalent, being responsible, in 2019, respectively for 81% and 15% of incident cases in 0-4-year-old children, and 45% and 31% in adolescents and young adults (15-24 years old) (3). The current Italian National Immunization Prevention Plan (PNPV) 2017-2019 offers MenACWY135 to this populations (also to individuals previously with MenC), with coverage goal of 95% of subjects aged 11 to 18 years by 2019 (4). In the previous PNPV (edition 2012-2014), adolescents were offered one dose of MenC vaccine (4), whereas, MenB vaccine value has been proved also from the Italian National Healthcare Service perspective and demanded to regional policies (2,4). Indeed, MenB vaccine is currently offered to adolescents free-of-charge or in co-payment – or is under consideration for the inclusion in vaccination plans – exclusively in some regions, including Campania, Emilia Romagna, Lazio, Liguria, Puglia, Sicily, and others. These differences may drive health inequalities, as well as different level of vaccine coverage.

Here, we analyse current surveillance data on vaccination coverage in adolescents across Italian regions, as crucial information to track vaccination programs' implementation, and to inform public health policies (5). National and region-stratified vaccination coverage rated are made available through annual reports of the Italian Ministry of Health, and last data available are referred to 2020 (6).

Coverage data for 2020 reports information stratified by two adolescend cohorts, namely 16- and 18-year-old subjects (born in 2004 and 2002, respectively) for both MenC and MenACWY135. The first was administered in 58.6% and 54.0% of the two cohorts. Regional differences are shown in Fig. 1A and 1B: no region reached the 95% coverage goal, with highest rates registered in Emilia Romagna (91.4 and 89.2% for the two cohorts), followed by some of the Northern regions. MenACWY135 administrations also peaked in Emilia Romagna (88.2 and 85.1%), but they were appreciably lower in all the Italian regions compared with those of MenC vaccine (Fig. 1C and 1D).

Beyond the crude coverage information presented, the rates reported by the Italian Ministry of Health deserve particular attention both in clinical practice and research. Of note, while the coverage goals are far to be reached, meningococcal vaccine coverage markedly increased from 2017 to 2019, by virtue of public health efforts made over those three years peaking at

In the light of the high health and societal burden due to IMDs, the importance of routine vaccination against *N. meningitidis* infection should be enhanced through the research of vaccination hesitancy drivers (13); the inclusion, at national level, of MenB for adolescents and young adults; and the promotion of educational community-based programs designed to improve general public's awareness and acceptance (14). In this context, important lessons can be learned from the global fight against COVID-19 emergency (8,15), in which effective and timely vaccination proved to be a crucial strategy for the control of the pandemic (16,17).

All together, these concerns are also part of the Global Vaccine Action Plan developed by the World Health Organization (5), which supports routinary vaccination plans and programs, aiming at fighitng IMD by 2030.

Conflicts of interest: Each author declares that he or she has no commercial associations (e.g. consultancies, stock ownership, equity interest, patent/licensing arrangement etc.) that might pose a conflict of interest in connection with the submitted article.

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