World Health Organization

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Questions and Answers on new facts and figures on vaccines and the global mercury treaty

Q. Are there new data on the human health impact of thiomersal in vaccines?

A. Yes, an independent scientific advisory body convened by WHO, the Global Advisory Committee on Vaccine Safety (GACVS), reviewed the latest data on 7 June 2012. The report of the meeting will be published in the WHO Weekly Epidemiological Record on 20 July 2012 (http://www.who.int/wer/2012/en/). The Committee concluded that numerous well-designed epidemiological studies conducted in many countries have failed to find a causal relationship between prenatal, neonatal, or postnatal exposures to thiomersal in vaccines and a host of neuropsychological outcomes, including autism. The small number of studies which had suggested an association had significant flaws in their design and underlying assumptions, thus invalidating their conclusions. Other studies conducted since 2008, including analysis of mercury in blood and hair, provided confirmation that the half - life of thiomersal (ethyl mercury) was much shorter than that of methyl mercury.

Q. Are there new data from animal models on thiomersal?

A. Yes, new animal studies in mice, rats and non-human primates have evaluated thiomersal exposure and possible adverse behavioral, histopathological or neurochemical outcomes. On review, studies which claimed associations were found to either be using doses or dosing intervals that were not relevant to the human situation or making claims that were not confirmed. Of note, new mathematical models are now available to further evaluate the kinetic and toxicological differences between ethyl and methyl mercury.

Q. What is the WHO position on the safety of thiomersal taking into account these new data?

A. WHO remains of the opinion that there is no scientifically-sound evidence to show that there is a possible health hazard associated with the amounts of thiomersal currently used in human vaccines. Vaccine safety is a primary concern for WHO and GACVS serves as its independent expert group. WHO will continue to provide rigorous, scientifically valid, evaluation of new data on safety that emerges in the future.

Q. Can thiomersal be replaced with alternative preservatives?

A. WHO convened an expert scientific meeting on 3 and 4 April 2012 and examined this question in depth. Evidence was presented that current alternative preservatives (products other than thiomersal that are used in a small number of vaccines) interact in unpredictable ways with existing vaccines. At this point, there is consensus that no ideal alternative preservatives will be available for the near- or mid-term. The limited data available showed alternative preservatives, such as 2-phenoxy ethanol, to have

variable anti-microbial effectiveness, which differs from vaccine to vaccine, and to have different compatibilities with different vaccine components such as antigens and excipients.

Q. Is there a research and development pipeline of alternative preservatives?

A. Experts at the 3-4 April meeting advised that, while important, development of new preservatives will be an unpredictable, cost-intensive, time consuming, trial and error, case-by case process. There are, for example, significant technical barriers such as no anti-microbial effectiveness standards and assays that predict field performance. However research on alternatives should be encouraged to support the broad objectives of the mercury treaty (to reduce human releases of mercury) and not because of any health threat from thiomersal.

As absence of thiomersal would seriously interrupt the manufacture of particular vaccines such as pertussis (whooping cough) and seasonal and pandemic influenza vaccines, research should be conducted on alternatives to the use of thiomersal in the manufacturing process. The research investment should also consider immunization programme changes such as new technologies for maintaining sterility when withdrawing doses from a multiple dose vial, new requirements for vaccine handling, logistics and waste disposal.

Q. Are there new data on the possibility to switch, globally, to single-dose preservative free vaccine presentations?

A. Yes, the WHO meeting on 3-4 April 2012, plus the WHO Immunization Practices Advisory Committee meeting on 18 April 2012, heard from experts that this option would have would have a significant impact on vaccine costs as well as on operational matters such as vaccine storage, delivery and waste management and would limit access. This research was based on a survey of manufacturers and modeling based on procurement patterns by UN agencies, as well as available data from selected countries. Development costs and time to shift to thiomersal-free vaccines are considered substantial, with the outcome of trials and future vaccine stability uncertain. The likely increase in cost to the countries buying vaccines varies.

For vaccines that are procured by UN agencies, it is estimated that a preservative-free approach corresponds to an annual increase of $130 million which is 50% of the current cost of thiomersal-containing vaccines. The number of international vaccine shipments by airfreight will rise substantially, with a commensurate increase in carbon dioxide emissions. Volume implications for cold chain storage are significant, varying from 165% to 324% increases, with major impact on central and peripheral stores. Waste management implications are of the order of a tripling of impact with a shift to all single-dose vials, increasing vial waste from 2,350 m^3 (2011 UN agency procurement data) to between 3,850 m^3 and 7,600 m^3.

Q. What is the WHO position on global use of single dose preservative-free presentations?

A. A shift to global use of single dose preservative-free presentations would almost certainly lead to severe vaccine shortages due to the major impact on manufacturing, distribution, vaccine costs and

environmental waste; and the greater workload for logistic and nursing staff. Overall there is considered to be a high risk of serious immunization program disruption, particularly in countries with fragile health systems. WHO continues to support use of multi-dose vials because it increases flexibility in handling and storage of vaccines.

Q. Is there an equity issue concerning thiomersal-free vaccines?

A. Yes; since thiomersal in vaccines is not a health threat and since thiomersal-containing vaccines are essential to allow all populations in all countries of the world to have access to these life-saving medicines at affordable prices then restricting access to thiomersal-containing vaccines would create inequity. This is because countries would need more resources (human, financial, infrastructure) to deliver their vaccines; the poorest and most disadvantaged populations would most likely miss out if countries could not scale-up their resources to cover their entire population. Access to safe vaccines, no matter where one lives, is of the utmost importance to WHO. Thiomersal-containing vaccines facilitate access.

Q. Is there new WHO guidance to countries?

A. Yes; policy implications for immunization programmes resulting from the mercury treaty negotiations were addressed by the WHO Strategic Advisory Group of Experts for Immunization on 12 April 2012, and were published in the WHO Weekly Epidemiological Record on 25 May (http://www.who.int/wer/2012/wer8721.pdf).

Based on multiple expert reviews, WHO concluded that there would be a clear risk (if reformulation with alternative preservatives or with no preservatives is required) that some products would become unavailable – particularly the current low cost vaccines. There would be a high risk of serious disruption to routine immunization programmes and mass immunization campaigns if currently thiomersal-preserved vaccines are not available. The consequences would be a negative health impact, due to the predictable and sizable increase in mortality through lack of access to vaccines, for very limited environmental impact.

WHO reaffirms that thiomersal-containing vaccines are very safe. They are essential and currently irreplaceable components of immunization programmes, especially in developing countries, and removal of these products would disproportionately jeopardize the health and lives of the most disadvantaged children worldwide.

Whilst WHO supports global moves to minimize mercury releases to the environment, it is essential that access to thiomersal-containing vaccines is not restricted under this global initiative. Due to the unpredictable nature of research, efforts must not create artificial timelines to transition to non-thiomersal containing products. WHO will continue to monitor the development of alternative presentations. If non-thiomersal based alternatives are developed that are globally viable and cost-effective, then the WHO position will be re-visited.

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