The old Edward Jenner and the new public health: the future of vaccines in Europe

Walter Ricciardi

Vaccination’, was the word that Jenner invented for his treatment against smallpox (from the Latin vacca, a cow), and so successful did his innovation prove that by 1840 the British government had banned alternative preventive treatments and the word was adopted by Pasteur for immunization against any disease. After clean water, vaccination is the most effective public health intervention in the world for saving lives and promoting good health but vaccines and vaccination are at a turning point. A number of new vaccines with major potential for controlling infectious diseases have just been licensed or are at advanced stages of development. Among the illnesses targeted are rotavirus diarrhoea, pneumococcal disease and cervical cancer (as caused by human papilloma-virus), which together kill more than a million people each year, most of them in developing countries.

Recent advances in genetics and immunology have increased our understanding of microbial pathogenesis and of host defence mechanisms. As a result, within the next 20 years, a whole set of new vaccines should become available. These will not only be used to prevent infectious diseases but also for preventing neoplasms, diabetes, Alzheimer’s disease and nicotine and cocaine dependence. Also under development are therapeutic vaccines to treat autoimmune diseases and allergic disorders. New vaccine delivery technology will provide easier delivery routes (such as transcutaneous, depot, nasal and oral delivery) without compromising efficacy. The increasing availability of vaccines has raised new questions and issues that already limit their introduction into routine use. Parents are becoming concerned about the high number of vaccines given to their children. Although considerable efforts are being made to facilitate vaccine administration, infant immunization schedules are already quite full and may not readily allow the addition of many new vaccines. As adverse events related to vaccines become more obvious than some diseases prevented by vaccines, targets to maintain a high level of vaccination coverage for the benefit of the community are at risk of being compromised by small but active groups of opponents to immunization. Last but not least, a major obstacle towards the use of new vaccines is their cost.

As a consequence of the investments made in research and development, new vaccines will probably be more expensive than older ones. However, their cost effectiveness will generally be high, and the great value of vaccination as a preventive intervention should be properly compared with the costs of increasingly expensive therapeutic interventions.

At this point, it should be clear that it is difficult to predict to what extent these advances will lead to effective and affordable clinical and public-health interventions. Policy should therefore ensue that expertise in all the pertinent fields, public-health professionals at first, prepare the ground and enable society and citizens to be equipped and respond responsibly. To make this happen, the provision of education and training for health providers in the vaccination fields and related disciplines is demanded. Some research indicates that health care providers are poorly prepared to integrate new vaccines into practice. In order to achieve this goal a development of infrastructures for training courses in vaccines, health care and economics directed to public-health professionals and health-care providers is required.

In conclusion, an unfortunate feature of the ‘new vaccines age’ has been a tendency to hyperbole on the scope and timing of these important public-health interventions. Since a shared methodology for a proper evaluation of new vaccines is not existing yet in Europe, health service research should work hard to identify universal criteria against which to evaluate new vaccines, taking into account also the acceptability and the potential for harm of the testing process itself. So, public-health professionals and policy-makers in the next decade would do well to clarify the conditions in which the ‘new vaccines revolution’ would result in public health benefits.

References