

thermore, post implementation research is needed to document the positive effect of vaccination on nasopharyngeal carriage as well as the overall reduction in pneumococcal infections, at the community level and in risk groups. Since the vaccine is prepared by a fraction of pathogenic serotypes, an increase of invasive disease caused by virulent non-vaccine serotypes could replace that disease eliminated by vaccination. A randomised trial showed that although this vaccine decreased episodes of otitis media due to serotypes contained in the vaccine by 57%, episodes due to non-cross reactive serotypes increased by 33%.¹⁰ Thus very careful monitoring of pneumococcal disease episodes (absolute numbers and serotypes causing each episode) is necessary, after any change in strategy.

For healthcare policy makers, cost effectiveness is another important consideration. A cost benefit analysis in the United States has shown that protein conjugate pneumococcal vaccine could be cost effective among healthy infants and children.¹¹ However, the current cost is high enough and many governments in the Western world are hesitant to pay for protein conjugate pneumococcal vaccines. For developing countries, which carry the vast majority of the global burden of pneumococcal disease, the cost is prohibitive. Undernourished children worldwide are probably the group with the highest risk, and they may continue to remain outside the realm of clinical testing and use unless cost issues are resolved. Similarly, cost benefit must also be assessed in elderly and immunodeficient patients. Clinical studies should capture deaths from pneumococcal disease, overall mortality and morbidity, the use of other treatments, especially antibiotics, and the indirect implications for potential curtailment of bacterial resistance.

In the era of the global spread of multidrug resistant *Streptococcus pneumoniae*,¹² generating data about the efficacy of protein conjugate pneumococcal vaccine from individuals at risk is an important priority. Both the industry and health authorities should show interest in undertaking and covering the cost of randomised trials. In the United Kingdom an efficacy study among elderly people will begin soon, sponsored by the Department of Health (N French, personal communication). If efficacy of the protein conjugate pneumococcal vaccine is established and the means are found for its implementation in both developed and developing countries, the contribution to

health globally could be immense. In contrast, if the protein conjugate pneumococcal vaccine fails to fulfil these expectations, other options such as peptide vaccines may need to be developed to cover the existing gaps in invasive pneumococcal disease prevention.

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Global nursing shortages

Are often a symptom of wider health system or societal ailments

In October 2001 government chief nurses and other delegates from 66 countries met to discuss how best to deal with a common challenge—the global growth of nursing shortages.¹ Nursing shortages in the United Kingdom and elsewhere have been a repetitive phenomenon, usually due to an increasing demand for nurses outstripping static or a more slowly growing supply.² This time the situation is more serious. Demand

continues to grow, while projections for supply point to actual reductions in the availability of nurses in some developed and developing countries. Some health systems are also coping with the legacy of ill conceived reform projects of the 1990s, which demotivated and disenfranchised nurses and other staff.

Developed countries are facing a demographic double whammy. The United States, United Kingdom,

Australia, Canada, and other countries have an ageing nursing workforce, caring for increasing numbers of elderly people.³⁻⁵ The challenge is how to replace the many nurses who will retire over the decade. Some countries also have to cope with reductions in numbers entering the nursing profession. Attractive alternative opportunities are now available to the young women who have been the traditional recruits into the profession.

The crisis of nursing shortage in these countries is now firmly on the policy agenda, and initiatives are underway in four main areas.⁶ Firstly, improving retention—keeping the scarce nurses already in employment. Research indicates that nurses are attracted to work and remain in work because of the opportunities to develop professionally, to gain autonomy, and to participate in decision making, while being fairly rewarded.⁷ Factors related to work environment can be crucial,⁸ and there is some evidence that a decentralised style of management, flexible employment opportunities, and access to continuing professional development can improve both the retention of nursing staff and patient care.⁹

Secondly, countries can broaden the recruitment base. Nursing has often recruited from a narrowly delineated group of young women. Some countries are now trying to open out access routes into nursing for a broader range of recruits, including mature entrants, entrants from ethnic minorities, and less qualified entrants who have vocational qualifications or work based experience.

A third strategy is to attract returners back into the profession. Most countries have relatively large pools of former nurses with the necessary qualifications, on paper at least, to re-enter nursing. They are attractive to governments because they appear to offer a relatively quick fix. Nevertheless, attention has to be paid to why the nurses left the health system in the first place and what needs to be done to get them back.

A fourth intervention is importing nurses from other countries. Active international recruitment of nurses is happening on a large scale as employers from one country target another country, and recruit 50 or 100 nurses at a time. Developed countries can exploit push factors, which make some nurses in developing countries willing to cross national boundaries. These factors include relatively low pay, poor career structures, lack of opportunities for further education, and in some countries, the threat of violence. The ethics of some of these recruitment practices remain open to question, particularly if a shortage is not being solved, and is merely being redistributed to a country less well equipped to deal with it.

The limitation of the above solutions is that they focus on nursing as the problem. In reality nursing shortages are often a symptom of wider health system or societal ailments. Nursing in many countries continues to be undervalued as women's work, and nurses are given only limited access to resources to make them effective in their jobs and careers. For sustainable solu-

tions other interventions will also be needed. These should be based on the recognition that health care is labour intensive and that available nursing resources must be used effectively. Shortage is not just about numbers but about how the health system functions to enable nurses to use their skills effectively.

Many countries need to enhance, reorientate, and integrate their workforce planning capacity across occupations and disciplines to identify the skills and roles needed to meet identified service needs. They can also improve day to day matching of nurse staffing with workload. Flexibility should be about using working patterns that are efficient, but which also support nurses in maintaining a balance between their work and personal life.

A wider perspective is needed to achieve clarity of roles and a better balance of registered nurses, physicians, other health professionals, and support workers. The evidence base on skill mix is developing,¹⁰⁻¹² and many studies highlight the scope for effective deployment of clinical nurse specialists and nurse practitioners in advanced roles.

Why have these wider reaching interventions not been more systematically implemented? The very fact that they have a wider reach means that they often challenge current practice, health system inertia, and vested interests. Nursing shortages are then portrayed as a problem only for nursing. They are not; they are a health system problem, which undermines health system effectiveness and requires health system solutions.

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