GLOBAL HEALTH PRESS

VACCINES VS ANTIMICROBIAL RESISTANCE: PREVENTING INFECTIONS, PRESERVING ANTIBIOTICS

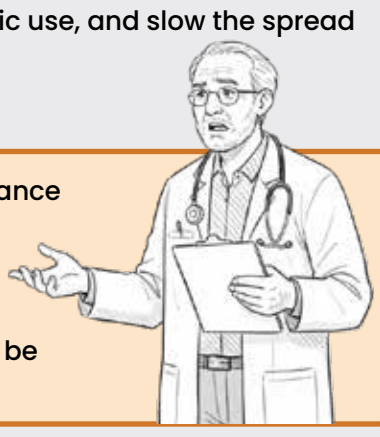
1. Core message:

Fewer infections → **Fewer antibiotics** → **Less resistance**

Vaccines are a powerful, underused tool to prevent infections, reduce antibiotic use, and slow the spread of antimicrobial resistance (AMR).

The AMR problem

- Common infections are becoming harder to treat as bacteria develop resistance to widely used antibiotics.
- Respiratory and diarrheal diseases account for a large share of antibiotic prescriptions, especially in young children and older adults.
- Many of these infections are vaccine preventable or their complications can be reduced by vaccination.



2. How vaccines act on AMR pathways

2.1 Prevent infections

- Vaccines such as pneumococcal conjugate, Hib, rotavirus, typhoid and meningococcal vaccines prevent bacterial or viral infections that would otherwise trigger antibiotic use.
- Prevented infections mean fewer consultations, fewer antibiotic courses, and fewer opportunities for resistant bacteria to emerge or spread.

2.2 Reduce severity and complications

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2.3 Interrupt transmission and colonization

- By reducing carriage and shedding (e.g. pneumococcal conjugate vaccines in children), vaccines lower transmission of both susceptible and resistant strains.
- Herd protection extends benefits to unvaccinated individuals and reduces the overall pool of resistant bacteria in the community.

2.4 Target high resistance pathogens

- Typhoid conjugate vaccines can decrease reliance on fluoroquinolones and third generation cephalosporins in high burden settings.
- Conjugate and protein based vaccines against encapsulated bacteria reduce infections where resistance is already widespread.

3. Examples for practice and policy

3.1 Pneumococcal conjugate vaccines (PCV)

- Reduce vaccine type invasive pneumococcal disease and carriage, including strains resistant to penicillin and macrolides.
- In countries where recommended and implemented, declines in antibiotic resistant pneumococcal infections and fewer antibiotic prescriptions for otitis media after PCV introduction are documented.

3.2 Influenza vaccines

- Lower the incidence of influenza, reducing inappropriate antibiotic use for viral respiratory illness.
- Decrease the risk of secondary bacterial pneumonia and related hospitalizations, especially in older adults and people with chronic diseases.

3.3 Typhoid conjugate vaccines (TCV)

- Cut the incidence of typhoid fever and the need for prolonged antibiotic therapy in endemic settings.
- Help curb the spread of multidrug resistant and extensively drug resistant Salmonella Typhi.

3.4 Childhood vaccines (Hib, pertussis, rotavirus)

- Reduce common childhood infections that frequently lead to empiric antibiotic prescribing (e.g. lower respiratory infections, otitis, diarrhea).
- Contribute to lower cumulative antibiotic exposure in early life, when the gut microbiome and resistome are developing.

4. What this means for public health

4.1 Integrate vaccines into AMR strategies

- National AMR action plans should explicitly list vaccines as core AMR interventions, alongside stewardship, infection prevention and diagnostics.
- Decision makers can use vaccine driven reductions in antibiotic use and resistant infections to justify investments in new and existing vaccines.

4.2 Use AMR arguments to strengthen immunization programmes

- Demonstrating AMR co benefits can support financing for PCV, TCV, influenza, RSV and other vaccines, especially in constrained budgets.
- Linking immunization with AMR resonates with health security, hospital capacity and economic arguments beyond traditional child survival framing.

4.3 Embed vaccines into clinical stewardship

- Vaccination status can become a standard element of antibiotic stewardship workflows in primary care and hospitals.
- Opportunities include pre discharge vaccination, prompts in electronic prescribing systems, and vaccination as part of chronic disease and elderly care.

4.4 Communicate clearly to professionals and the public

- For clinicians: “Every prevented infection is one less chance for resistance to emerge.”
- For the public: “Vaccines protect you from infection and help keep antibiotics working when you really need them.”

References

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