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Hospital hygiene: The new battleground in reducing antimicrobial resistance

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The AMR problem

- Antimicrobial resistance (AMR) is the result of (over)consumption of antibiotics. Bacteria become resistant to antibiotics. Hospital patients die from diseases that previously were not lethal like pneumonia or sepsis
- Some 35,000 people annually in the EU die as a result of AMR
- AMR means that routine surgery like appendix removal or hip replacement can entail significant risk of infection by multi-resistant bacteria
- Antibiotics are used both as a medicine and in animal food production to prevent infection and stimulate growth
- Multiresistant bacteria are spread globally through travel and trade



The research project

- We study the strategies to coordinate the work against AMR within and among the EU member states
- Mixed methods including a survey among senior public servants in all EU member states; network analysis; studies of National Action Plans and other strategy documents
- Interviews with senior AMR experts in all EU member states plus the UK, Norway, the WHO and EU Commission public servants (in total >40 interviews)



How do we fix AMR?



- Reducing the use of antibiotics is key
- International coordinated action
- Improving antibiotic stewardship
- Improving hospital hygiene
- Uncovering the cause of the causes; why do people acquire infections?
- The 'One Health' approach



The AMR situation in the EU

- Overall, the use of antibiotics is decreasing, surveillance is more comprehensive and stewardship is improving
- The incidence of multiresistant bacteria in hospitals is increasing
- Politicians, particularly in the Central European countries, are not prioritizing AMR
- The EU has full regulatory authority in the veterinarian sector but much less authority in human public health
- The EU is launching a major new public health program, "EU4Health"



Hospital hygiene and AMR in Denmark

- The incidence of multi-resistant bacteria is increasing rapidly
- CPE (Carbapenemase-producing enterobacteriaceae) is spreading at an extreme rate in some hospitals
- VRE (Vancomycinresistant enterokock), “the new ghost in town”, is also increasing
- Collaboration between Sundhedsstyrelsen and Statens Serum Institut



Hospital hygiene across the EU (1)

- **Denmark:** “The key problem is healthcare hygiene, i.e. preventing spread of AMR in a system which is under extreme pressure. VRE (Vancomycinresistent enterokock) is extremely difficult to handle. They only emerge in hospitals and they stay in hospitals.”
- **Sweden:** “We have had a reduction in antibiotics sales over the past 25-30 years and yet antimicrobial resistance is increasing. This suggests that the use of antibiotics in healthcare and healthcare hygiene is a problematic area.”
- **Hungary:** “The high level of consumption of broad-spectrum antibiotics contributes to the high number of hospital-acquired infections by multi-resistant bacteria.”
- **Czech Republic:** “Hygiene was a significant problem in the former Soviet Union and we are still wrestling with problems related to hygiene in hospitals and the microbiological problems it gives rise to. We are suffering from the lack of hospital epidemiologists who are able to deal with hospital-acquired infections.”



Hospital hygiene across the EU (2)

- **Germany:** “We have also had problems with multi-resistant bacteria in hospital care, particularly intensive care.”
- **Portugal:** “We have problems with an excess of health-care associated infections, particularly hospital-acquired infections. “
- **The Netherlands:** “Almost half of the cases of CPE that we find are coming from abroad, brought here by people who had travelled during the last three months. The rest have domestic sources; it may come from antibiotics use or overuse or misuse. We do not think this development is the result of poor hospital hygiene or lacking infection protection and control (IPC). If that had been the case we would see more outbreaks but we have only seen a very small number of outbreaks.”
- **UK:** “The number of infections in hospitals continues to increase, some population groups and age group and geographical areas much more marked than others. We have seen dramatic improvement in terms of MRSA and CPE which continue to increase globally but much less so in the UK.”



What to do?

- Improving hygiene, but it does not solve the problem completely
- Pre-emptively screening patients going into hospitals
- Increase the number of single-patient rooms
- Ensure satisfactory laboratory and clinical microbiology capacity
- Training, education, raising awareness



Why are the bugs winning?

- It is not enough that some countries reduce the use of antibiotics when other countries do not reduce their use
- The pharmaceutical industry has little incentives to develop new antibiotics which medical doctors are told not to use
- AMR is an evolutionary response to antibiotics. "We can't fight evolution. We can only improve antibiotic stewardship"
- We need to ask ourselves why it is that some groups in society are more likely to develop infections. The "cause of the causes"