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European strategic action plan on antibiotic resistance

The strategic action plan on antibiotic resistance is submitted to the Regional Committee for approval, building on the momentum created by World Health Day in 2011: “No action today, no cure tomorrow”. The use, but especially the overuse, misuse and underuse, of antimicrobial agents often leads to the adaptation of micro-organisms through mutation, genetic recombination and selection, so that resistant strains may become the predominant organism in the community, health care settings or the environment. In the WHO European Region, the development of antibiotic resistance is also complicating the treatment of a large range of common infections in ambulatory care, such as respiratory and urinary tract infections, sexually transmitted infections or food- and waterborne infections. In some countries, the use of antibiotics in the veterinary, food animal production and agriculture sectors exceeds their use in humans and further adds to the emergence of resistant bacteria, which can easily spread between people, animals, products and the environment.

In 29 countries of the Region, an estimated 25 000 people die every year because of infections related to antibiotic resistance, most of them contracted in health care settings. They give rise to considerable health costs as a result of longer hospital stays and more expensive treatment, as well as direct and indirect costs to society. Moreover, bacterial multidrug resistance is increasingly threatening the outcome of many common medical interventions and diagnostic procedures that until recently were considered safe or low-risk.

Although microbial resistance to other antimicrobial agents such as antiparasitic and antiviral drugs is occurring and is important, the focus on antibiotic resistance in the European Region is justified by its extensive prevalence and especially its rapid development against a number of last-resort antibiotics used to treat life-threatening infections in health care settings, a situation that may soon lead to potentially untreatable infections.

A number of key strategic actions are proposed to mitigate, prevent and control antibiotic resistance. These include promoting national coordination to implement national strategic plans of action and develop regulatory functions and guidance; promoting the prudent use of antibiotics across many sectors; strengthening surveillance systems to monitor the use of antibiotics and resistant bacteria; and creating awareness of the prudent use of antibiotics and the fact that new antibiotic drugs are not coming onto the market soon.

The resistance developed by mycobacteria, such as is seen in multidrug- and extensively drug-resistant tuberculosis (M/XDR-TB), is presented in a separate strategy paper, using similar concepts integrated within the tuberculosis control programme.

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Background

1. Four years after drug companies began mass-producing penicillin in 1943, microbes began appearing that could resist it; *Staphylococcus aureus* was the first bacterium to have found a successful adaptation to resist this ground-breaking antibiotic drug. The use, and especially the inappropriate use, of antibiotics is the key driver for the development of antibiotic resistance. This is primarily caused by a combination of overuse, particularly to treat minor or non-bacterial infections or to extend prophylaxis beyond 24 hours; misuse due to faulty diagnosis or lack of information about alternative appropriate treatments; and underuse as a result of lack of access or financial means to complete an antibiotic course or simply insufficient compliance with the prescribed course. Although the use of antibiotics as a growth promoter in healthy food animals has been banned in the European Union (EU) (but not in other parts of the Region), the use of antibiotics in animals sometimes exceeds their use in humans.

2. Resistance to antibiotics, defined as antimicrobial agents that act against bacteria, is the main priority in the WHO European Region, but resistance can occur to any antimicrobial agent. This includes the development of resistance not only in viruses to antiviral drugs such as those used in antiretroviral therapy of HIV/AIDS or against influenza, but also in parasites to antiparasitic drugs such as artemisinin against malaria and in fungi to antifungal agents. Through selective pressure, a new strain of any micro-organism may emerge that resists antimicrobial drugs. To address the global scope of the containment of antimicrobial resistance in bacteria, viruses, parasites and fungi, WHO developed a global strategy for containment of antimicrobial resistance, published in 2001.

3. Since 1998 the European Antimicrobial Resistance Surveillance Network (EARS-Net), now run by the European Centre for Disease Prevention and Control (ECDC), has been collecting information from all EU countries. Resistance to methicillin by *S. aureus* (methicillin-resistant *S. aureus*, MRSA) is close to 50% in some Member States and reaches 25% or more in several other EU countries. Resistance of Gram-negative bacteria such as *Escherichia coli* and *Klebsiella pneumoniae* is rapidly increasing in southern and eastern Europe. In the EU (and in Norway and Iceland), an estimated 25 000 patients die each year and about € 0.9 billion are spent on additional health care costs related to a limited number of resistant bacteria. Information collected by the European Surveillance of Antimicrobial Consumption (ESAC), now also managed by ECDC, shows that antibiotic consumption in countries in the east and south of the EU is much higher than in the north, leading to increased levels of drug resistance. Much less is known of the situation with regard to resistance and antibiotic consumption in other countries in the WHO European Region, but some individual Member States (such as Croatia, the Russian Federation and Turkey) have made progress in surveillance of antibiotic resistance and have reported the prevalence of MRSA as being over 30% in some studies.

4. In the past thirty years only two novel classes of antibiotics have entered the market, oxazolidinones and cyclic lipopeptides, both used against Gram-positive bacterial infections. No new drugs against Gram-negative bacteria such as *E. coli* and *K. pneumoniae* have entered the market. Many hospitals lack appropriate laboratory infrastructure for sensitivity testing to antibiotics, and many infections are therefore treated without information on the most appropriate drug therapy. Last-resort drugs such as carbapenems can no longer be used in life-threatening infections when the bacteria acquire new genes producing carbapenemase enzymes, such as the recently reported New Delhi metallo- β -lactamase 1 (NDM-1) found in *E. coli* and *K. pneumoniae*. These enterobacteriaceae are also common bacteria in animals and highlight the importance of the human–animal interface and the need for integrated surveillance systems that can monitor the emergence and spread of bacterial resistance.

5. In several countries the use of antibiotics in the veterinary, food animal production and agriculture sectors exceeds their use in humans and has been identified as a possible source of antibiotic-resistant bacteria that may also affect human populations.

6. It has been observed that, by implementing a wide range of appropriate measures, a reduction in the prevalence of antibiotic-resistant bacteria can be achieved by addressing the use, overuse and misuse of antibiotics in all sectors; this is well documented in some parts of the Region, especially in countries in northern Europe. The main considerations to be taken into account in a strategic action plan are accordingly the increased use of antibiotics in health care and in veterinary and agricultural settings; the increasing loss of last-resort antibiotics; the increase of life-threatening resistant bacterial infections in health care settings, together with health care-associated infections, leading to increased morbidity, mortality and costs; the acknowledgement that new antibiotics are not likely to become available soon; and the observation that a set of appropriate interventions can be effective in containing antibiotic resistance.

Justification

7. The problem of antimicrobial resistance was clearly identified in the early 1970s, and the first World Health Assembly resolution to call attention to the prudent use of drugs, including antibiotics, was adopted in 1984. Several other Health Assembly resolutions have drawn attention to antimicrobial resistance, and the WHO global strategy for containment of antimicrobial resistance, published in 2001, outlines the major directions for surveillance, prevention and control. It was followed in 2005 by resolution WHA58.27 calling on countries to improve their response to the increasing problem of antimicrobial resistance. However, not enough has been done to effectively implement the global strategy, and the call for action remains urgent and necessary in most WHO Member States globally.

8. In the WHO European Region, EU countries have developed national action plans in response to the 2001 Council Recommendation on the prudent use of antimicrobial agents in human medicine. Most recently, during the Swedish Council presidency in 2009 and the Spanish and Belgium presidencies in 2010, technical experts have explored directions for implementation of the WHO global strategy, including innovative incentives to promote research into new and effective antibiotics.

9. Health care systems in many countries in the European Region are still in different phases of reform and transition where, with a few exceptions, overall investments have gone into curative care. Not enough has yet been done to regulate for the prudent use of antibiotics, or to propose overall guidance on the use of antibiotics in the community and hospital settings. A number of countries still do not have systems for surveillance of antibiotic resistance, antibiotic use and hospital-acquired infections, and there is still very little access to sensitivity testing to guide the use of antibiotics, even in life-threatening bloodstream or respiratory infections. Health care-associated infections are an additional driving force behind the emergence and spread of antibiotic resistance. Infection control measures must be in place as part of prevention measures; further guidance on antibiotic use should be developed for health care settings; and effective measures such as stringent hand hygiene practices need to be fully implemented. There is little education about the prudent use of antibiotics in medical, veterinary and other health-related professions, leading to overprescribing and misuse. The lack of new drugs against bacterial infections is further a challenge to combating and preventing bacterial infections.

10. The problem of antibiotic resistance has been and remains neglected in many countries, in part owing to the fact that it is not properly documented through systematic surveillance systems. The increasing interconnections between countries and the globalization of trade and

travel further add to the risk of importing bacteria or genes that jeopardize effective treatment or the prevention of bacterial infections; this highlights the need for international standards and data sharing, including use of the International Health Regulations as a mechanism for reporting on new emerging public health risks associated with bacterial resistance to antibiotics.

11. To address this issue, a WHO technical advisory group consisting of 16 experts from the European Region met in August 2010 and proposed seven strategic objectives for a regional strategic action plan on antibiotic resistance.

Overall goals

12. The overall goals of the regional strategic action plan are:

- to reduce the morbidity, mortality and related direct and indirect costs associated with antibiotic resistance;
- to promote the establishment of national coordination and development of action plans that address the necessary intersectoral expertise to prevent, control and contain antibiotic resistance;
- to promote the prudent use of antibiotics and the systematic implementation of infection control measures for the prevention and treatment of bacterial infections in health care settings;
- to promote the need to address the interconnections of bacterial resistance and antibiotic use in human and animal health, including the food chain;
- to further look at and implement effective policies on teaching the prudent use of antibiotics in medical, veterinary and life science faculties;
- to raise overall awareness of the emergence and spread of antibiotic resistance and loss of effective antibiotics in life-threatening infections;
- to address the need to identify innovative finance and marketing mechanisms in order to develop new drugs against bacterial and other priority infections; and
- to promote the involvement of patient safety groups and other partners in actions at all levels that can prevent infections and reduce the need for antibiotic prescriptions.

Strategic objectives

13. The following seven strategic objectives are developed as guidance to national governments to address the complex factors that relate to bacterial resistance and its driver, antibiotic usage (especially overuse and misuse). They take into account the technical, financial, regulatory, educational and behavioural aspects that need to be addressed in comprehensive national plans of action. The regional strategic action plan should be used by policy-makers and other national stakeholders as an initial framework on which national action plans, guidance, regulations and organizational arrangements can be based. Antimicrobial resistance is a cross-cutting issue, and measures to counter it require inputs from and participation by many national and sometimes international partners, stakeholders or experts.

14. These objectives further emphasize the need to better understand the underlying causes of antibiotic resistance and to develop laboratory capacity in order to monitor national trends in antibiotic resistance, especially in life-threatening infections but also with regard to emerging mechanisms of resistance that can further affect the treatment and prevention of bacterial

infections in outpatient settings. These monitoring and surveillance systems should also be linked to mechanisms for international reporting of antibiotic resistance and consumption, since the globalization of travel and trade facilitates their international spread.

Strengthen national multisectoral coordination for the containment of antibiotic resistance

15. Member States should establish a sustainable, multisectoral, interdisciplinary and inclusive national committee that would monitor the public health risks and impact of antibiotic resistance in all sectors, recommend policy options; secure overall commitment to national strategies for the containment of antibiotic resistance; provide technical guidance on national analysis, standards, guidelines, regulations, training and awareness; and ensure coordination where needed. In addition to representatives of relevant government sectors, this committee should include representatives of national professional associations, authorities and leading scientific institutions. This committee is of crucial importance for overall coordination and development of a comprehensive national plan of action, and its work could be extended beyond antibiotic resistance to cover the whole field of antimicrobial resistance, including antiviral, antiparasitic or antifungal drugs.

Good practice

The major goal of the Dutch Working Party on Antibiotic Policy (SWAB) (<http://www.swab.nl/english>) is to help contain the spread of antimicrobial resistance and limit the expanding costs of the use of antibiotics. SWAB was founded in 1996 as an initiative of the Society of Infectious Diseases and the professional associations of medical microbiologists and hospital pharmacists. It has a president and 14 members, including an infectious disease specialist, microbiologist, hospital pharmacist, general practitioner, paediatrician, epidemiologist and veterinary biologist. The objectives of SWAB are to optimize the use of antibiotics by developing guidelines, carrying out education activities and ensuring the surveillance of antibiotic resistance.

SWAB has issued a number of guidelines on antibiotic treatment of different bacterial infections, and several of these have been published in English. Knowledge concerning antibiotics and its correct use help curtail resistance.

SWAB is developing an interactive, web-based educational programme for medical specialists using case studies. Successful completion of the programme leads to the award of continuous medical education points.

Many countries have similar committees that ensure the implementation of national policy and issue technical guidance.

Strengthen surveillance of antibiotic resistance

16. National surveillance systems, guided by international standards, should be developed to collect, analyse and report relevant data on occurrence and trends of resistance in relevant pathogens including alerts on the identification of newly emerging resistance. Sources of information should include clinical laboratories at hospitals, private clinics, university research laboratories, or food laboratories. Several existing reporting systems, such as WHONET, and specific tools and standards are available for use by national health authorities for surveillance and input to regional databases such as EARS-Net.

Good practice

The European Antimicrobial Resistance Surveillance Network (EARS-Net) (<http://www.ecdc.europa.eu/en/activities/surveillance/EARS-Net/Pages/index.aspx>), coordinated by ECDC in Stockholm, collects data from 27 EU member countries, as well as Iceland and Norway. Seven major invasive pathogens of public health importance are under surveillance: Streptococcus pneumoniae, Staphylococcus aureus, Escherichia coli, Enterococcus faecalis, Enterococcus faecium, Klebsiella pneumoniae and Pseudomonas aeruginosa.

The national networks in these 29 countries systematically collect data from clinical laboratories within each country; these now total over 900 laboratories serving 1400 hospitals. The resulting database, covering almost 400 million people, provides not only national data and trends of resistant bacteria but also comparable data across a large part of the WHO European Region. It constitutes an important source of information on antibiotic resistance for policy-makers, doctors, scientists and the public.

The 2009 EARS-Net report highlights the following key points:

- *a significant **increase** of antibiotic resistance in E.coli was observed between 2002 and 2009, suggesting an incremental burden of disease and a decline in antibiotic susceptibility;*
- *a different trend was seen for S.aureus, with a significant **decrease** in the proportion of methicillin resistance in a situation where the number of reported bloodstream infections increased by 38%. This may reflect the impact of infection control programmes in health care settings in some countries.*

Promote strategies for the rational use of antibiotics and strengthen surveillance of antibiotic consumption

17. The overuse, underuse and misuse of antibiotics in primary care and hospitals are a major factor in creating resistance. In some parts of the Region, the poor quality of antibiotics, sales of antibiotics without prescription and patients buying incomplete courses of treatment or the wrong antibiotic are important drivers of the development of resistance. A national government authority, agency or coordinating mechanism should be in place to oversee this particular area, establish systems for the surveillance of antibiotic consumption, draw up national guidelines on the prudent use of antibiotics and elaborate national regulations to ensure adherence to them. Guidance provided in medical or health-related teaching institutions is an effective investment in the future, since it should lead to less prescription of antibiotics. Over-the-counter sales without a prescription should be controlled, and pharmacists should be informed about the importance of quality and dosage and the critical situation of bacterial resistance. In health care settings, pharmacists can play an important role in promoting optimal antibiotic treatment options and standard treatment guidelines.

Good practice

National media campaigns on the prudent use of antibiotics in general practice and at community level have been organized since 2000 by the Belgian Antibiotic Policy Coordination Committee (BAPCOC) (<http://www.bapcoc.be/>), and it has also taken concrete action to establish surveillance systems, improve legislation on hospital hygiene and prepare specific guidelines on the prevention and treatment of bacterial infections. These campaigns have resulted in a steady decrease in the use of antibiotics in ambulatory care (6.2% per year). The correct use of antibiotics is also increasing because of the availability of BAPCOC guidelines and a pocket book-size antibiotic prescription guide. Resistance of streptococcal infections is steadily declining. Similar campaigns have been initiated and have shown success in France, Poland, Spain, the United Kingdom and other countries.

Strengthen infection control and surveillance of antibiotic resistance in health care settings

18. The intensive use of antibiotics in health care institutions, often without laboratory confirmation of antibiotic sensitivity, often leads to the emergence of antibiotic-resistant bacteria. Poor infection control often creates opportunities for transmission among patients and clinical staff. Prevention of hospital-acquired infections should be promoted through hospital infection control and surveillance committees that foster and monitor the prudent use of antibiotics, as well as analysing the occurrence of hospital-acquired infections such as bloodstream infections, surgical site infections and infections in intensive care units. This committee should be a key element in the management of hospitals and other health care institutions and also promote other disease prevention approaches such as immunization, campaigns on hand hygiene and other infection control measures.

Good practice

Methicillin-resistant Staphylococcus aureus (MRSA) is a nosocomial and difficult-to-treat bacterium in humans that results in infection, especially in relation to additional risk factors linked to health care settings and breaches of infection control such as the use of percutaneous lines and catheters, older age, recent hospitalization, recent antibiotic therapy and specific populations at risk. MRSA is resistant to a large group of antibiotics called the beta-lactams, which include the penicillins and the cephalosporins. The proportion of MRSA among all S. aureus infections is over 25% in 10 of the 28 countries participating in the European Antimicrobial Resistance Surveillance System network (EARS-Net). However, national efforts on infection control, including hand hygiene and other containment measures, have proved to be effective in halting the occurrence of resistance or even reversing these trends. The combination of these measures has resulted in a sustainable decrease of MRSA infections in Austria, France, Ireland, Latvia and the United Kingdom in recent years.

Prevent and control the development and spread of antibiotic resistance in the veterinary and agricultural sectors

19. The animal–human interface is important to public health. Antibiotics are used in veterinary medicine not only for therapeutic purposes, but also for prophylaxis and growth promotion in some countries. Bacteria, including resistant bacteria in animals, can emerge and spread through direct or indirect pathways into human populations. Antibiotic resistance is also a food safety issue, because resistant bacteria and resistance genes can spread from food animals to humans through the food chain. For example, resistance in Salmonella and Campylobacter is clearly linked to antibiotic use in food animals, and foodborne diseases in humans caused by

such resistant bacteria are well documented. Veterinarians and national veterinary and food safety authorities play a central role in ensuring the prudent use of antibiotics in food animal production and animal health and in encouraging good hygienic and infection control practices, so as to reduce the need for antibiotics. Furthermore, the use of antibiotics as growth promoters should be eliminated, and antibiotics should be available for animals only by veterinary prescription. Integrated systems for surveillance of antibiotic resistance (from humans, animals and foods) and of antibiotic usage in food animals should be established.

Good practice

The use of antibiotics as growth promoters has been banned in the European Union since 2006. It has been shown, in Denmark for example, that the use of antibiotic growth promoters can be discontinued and the risk to human health reduced, without harm to animal health or the production economy. In Denmark, Finland, Norway and Sweden – which have strong policies to restrict antibiotic use and a long tradition of disease prevention in animals – the veterinary usage of antibiotics is relatively low. This shows that antibiotic usage in food animal production can be limited when a prudent-use policy is implemented. In aquaculture – for instance, in Norwegian salmon production – the introduction of effective vaccines and improvement of environmental conditions have been shown to significantly reduce the need for and thus the use of antibiotics.

Promote innovation and research on new drugs and technology

20. Antibiotic resistance is increasing and very few new antibiotics are in development. In the past 30 years, only two truly novel classes of antibiotics have entered the market, both of them for treating Gram-positive bacterial infections (oxazolidinones, cyclic lipopeptides). With increasing resistance caused by extended-spectrum beta-lactamases (ESBL) and carbapenemase, treatment of Gram-negative infections has become difficult as “pan-resistance” to all known classes of antibiotics has emerged among some pathogens. The combination of the absence of new classes of antibiotics and increased antibiotic resistance leads to the urgent need to reduce the use of antibiotics, improve infection control and, by improving the initial diagnosis of bacterial infections, reduce the need to prescribe antibiotics at all. More scientific information on bacterial resistance is becoming available, and international surveillance networks should further improve information-sharing to identify the most promising research areas to combat drug resistance. Importantly, using an approach that combines multiple antimicrobial components is known to reduce the emergence of bacterial resistance and to increase patient adherence.

21. The complexity of drug research and development, as well as financial disincentives specific to antibiotics, are serious obstacles to expectations that effective new antibiotics will reach the market soon. Estimates of the cost of bringing a new chemical agent to market have ranged from US\$ 0.5 billion to US\$ 2 billion, but a recent public-private partnership on developing a new antituberculosis drug has been estimated at between US\$ 76 million and US\$ 115 million.

22. Governments and academic networks need to play an active role in research on new antimicrobial drugs, on making better use of available or older antibiotics and on accessible technology, especially in the areas of diagnostic sensitivity testing and point-of-care tests of bacterial infections. National and international task forces bringing together governments, academia, the health care system, industry, development agencies and others should jointly address the needs and solutions for new classes of antibiotics and diagnostic technologies that more effectively identify the cause of infection.

Good practice

During several recent presidencies of the European Union (such as those of Sweden in 2009 and Spain and Belgium in 2010), special events have been organized to address the need to develop incentives and foster innovation with regard to new antibiotic drugs and research into diagnostic technology. During the Swedish presidency in 2009, incentives and policies for promoting innovation in antibiotic research were analysed in collaboration with a number of European agencies, an independent global network for concerted action on antibiotic resistance (ReAct) and the European Observatory on Health Systems and Policies. Five underlying disincentives for developers of new drugs were identified, including the existence of generic market products, the need to address conservative usage of new drugs, the limited duration and limited sales volume of antibiotics, the emergence of resistance before drugs are actually marketed, and the influence of pricing and reimbursement. The report of the conference on “Innovative incentives for effective antibacterials” offers options for how governments, the private sector and academia can work together to overcome the current gap between resistant organisms and the development of new antibiotics.

Reliable diagnostic tests will greatly improve the appropriate prescription of antimicrobial drugs and reduce inappropriate prescriptions based on clinical assessment only. For instance, WHO’s Special Programme for Research and Training in Tropical Diseases (TDR), together with the Foundation for Innovative New Diagnostics (FINN), has supported a field evaluation of rapid diagnostic tests for malaria. The “Happy Audit” project (Health Alliance for Prudent Prescribing, Yield and Use of Anti-microbial Drugs in the Treatment of Respiratory Tract Infection), funded by the European Union, also aims to reduce antibiotic prescription by providing point-of-care diagnostic tests for respiratory infections.

Improve awareness, patient safety and partnership

23. Successful containment of antibiotic resistance ultimately depends on improved knowledge and responsibility by health care providers in prescribing and dispensing antibiotics, as well as on patients’ compliance. National education initiatives, behaviour change campaigns and various awareness programmes should be conducted to get all stakeholders and the public proactively involved in the containment of antibiotic resistance. The complex nature of antibiotic resistance and the use of antimicrobial agents require awareness on the part of a large range of partners and alliances. Collaboration between WHO, national reference centres, WHO collaborating centres and the European Commission, as well as its specialized agencies such as ECDC, the European Medicines Agency (EMA) and the European Food Safety Authority (EFSA), will also be essential. In addition, heightened awareness of antibiotic resistance is required from expert and scientific networks, professional associations, development agencies, the pharmaceutical industry, the private sector, patient groups and many other actors from different sectors.

Good practice

In 2011, World Health Day is dedicated to the urgent need to address the emergence of antimicrobial resistance and the lack of new drugs in the development “pipeline”. A communication plan has been developed to make five interest groups more aware of what their role could be in reversing these trends. Each of these groups can make an impact. Policy-makers can review the national situation and develop national action plans; doctors, dentists, pharmacists and veterinarians can make an impact on prescribing and the prudent use of antibiotics; the pharmaceutical industry can contribute to the development of new drugs and diagnostic tools; and the food animal industry and agriculture sector can contribute by using less antibiotics, especially as growth promoters. Finally, the public can contribute by understanding better when and how to balance the use of antibiotics, when they must be used and when they should not be used.

Patient safety groups in many countries have contributed to modifying the behaviour of both patients and health care workers, as evidence has shown that patients who request antibiotics are three times more likely to receive a prescription. Hand hygiene is the primary measure to prevent health care-associated infections. WHO’s Global Patient Safety Challenge included a campaign with the slogan “Clean care is safer care”, and new guidelines on modifying behaviour on hand hygiene were promoted. Studies have shown that when patients were educated on admission to ask health care workers to respect hand washing, the use of soap increased by 34% (to 94%).

Considerations for implementation and monitoring

24. Since antibiotic resistance is a complex issue involving many sectors of government and society, the development and implementation of a national action plan should be anchored in different sectors of the health care system. The strategic action points that have been outlined above refer to selected areas of the health care system, government or target groups. Key to this effort is the national coordinating committee, which should provide the stewardship to steer the different actions in a coherent fashion, at national and local levels, across many sectors of government and society.

25. In 2011, World Health Day is dedicated to combating antimicrobial resistance and will be launched under the slogan “No action today, no cure tomorrow”. In the WHO European Region, this will be an opportunity to raise awareness of antibiotic resistance in all countries, and also for partnership with the EU, which organizes European Antibiotic Awareness Day (EAAD) on 18 November each year.

26. The workplan for implementation of the strategic action plan would take a stepwise approach, starting with fact-finding related to available antibiotic resistance surveillance data, identification of existing practices, and other key elements needed to provide comprehensive information. This would form input for a consultation with policy experts, who would then be in a position to draw up policies related to public health and health systems.

27. The strategic action plan will include a timeframe for implementation, together with an estimate of the resources required. In order to improve monitoring of progress by Member States, a number of input, process and output indicators will be defined, so that regular progress reports could be shared as called for in World Health Assembly resolution WHA58.27 of 2005. A draft resolution defining concrete actions will be presented to the Regional Committee for endorsement.

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