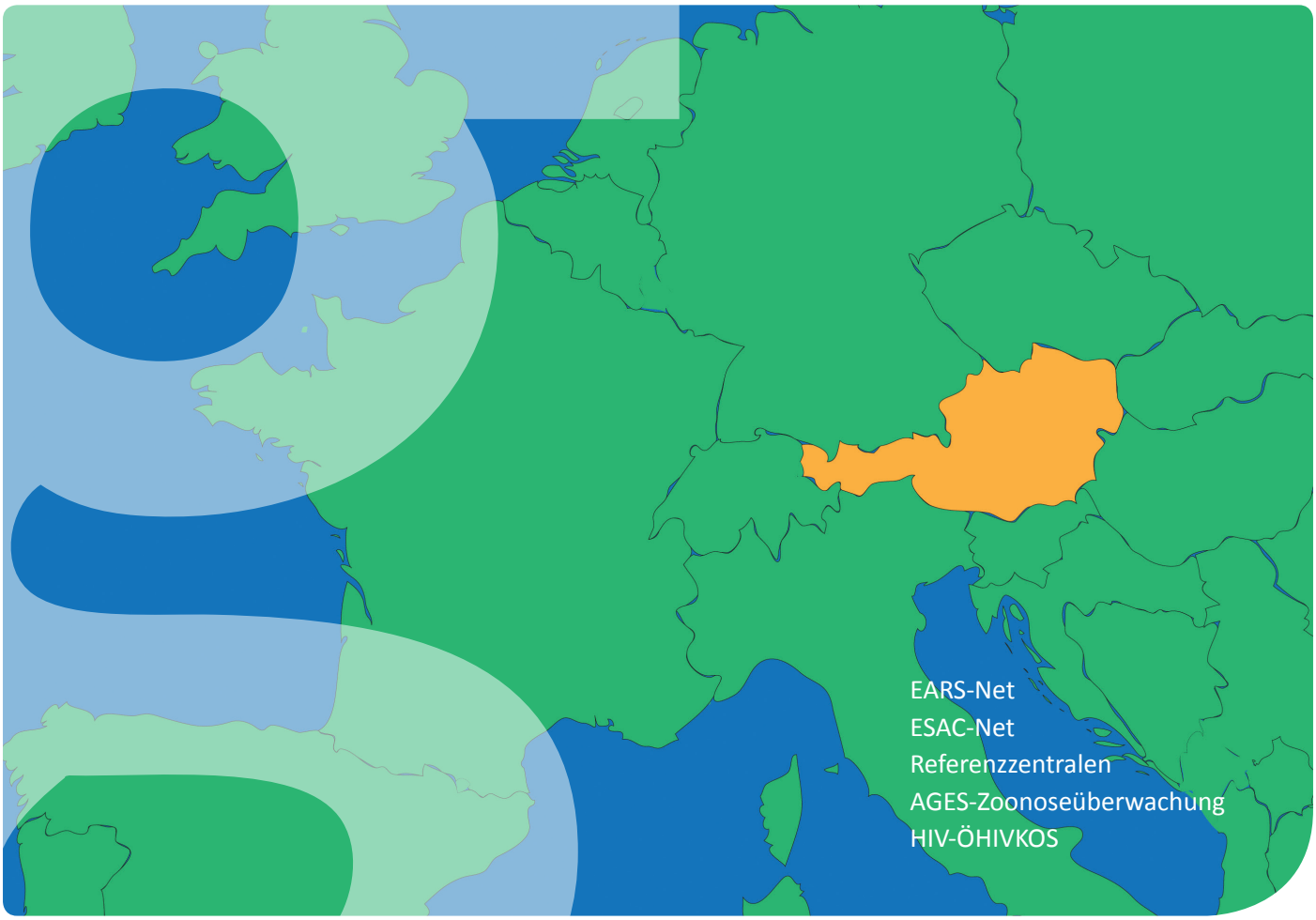
Allgemein öffentliches Krankenhaus
Elisabethinen Linz

AGES

BUNDESMINISTERIUM
FÜR GESUNDHEIT

Resistance Report Austria
AURES 2013

Summary



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FOREWORD


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The development of modern medicine would not have been possible without therapeutic use of antimicrobially active drugs. The resistance development that could be observed already soon after the medical use of the anti-infectives is disadvantageous, however. Because of the increasing resistance to antimicrobially active substances, it is increasingly necessary to propagate rational use of these therapeutic drugs. Since 2005, the resistance situation for antimicrobially active drugs in Austria is summarised in the form of AURES. The purpose of the publication of AURES is the information of professional circles and interested people about the current state of play.

On account of the great importance of the anti-microbial resistance for the safety of patients, it is a special concern to me that the entire Austrian population gets easy access to information about antibiotic resistance. This should be guaranteed in a first step through the creation of an abridged version of AURES.

The complete version of AURES is also available in addition to this summary to all interested persons. With the abridged version of AURES we want to reach a wider audience and spread the important knowledge about the resistance situation even further.

Dr.in Sabine Oberhauser, MAS
Bundesministerin für Gesundheit

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LIST OF ABBREVIATIONS

Table 1: List of abbreviation

Abbreviation	Long text
AGES	Austrian Agency for Health and Foodsafety (Österreichische Agentur für Gesundheit und Ernährungssicherheit GmbH)
ART	Antiretroviral therapy (Antiretrovirale Therapie)
AT	Austria (Österreich)
BIOHAZ	Biological Hazards (biologische Gefahr/-en)
CASCADE	Concerted Action on SeroConversion to AIDS and Death in Europe
CLSI	Clinical and Laboratory Standards Institute
EARS-Net	European Antimicrobial Resistance Surveillance Network
ECDC	European Centre for Disease Prevention and Control (Europäisches Zentrum für Seuchenbekämpfung)
EFSA	European Food Safety Authority (Europäische Behörde für Lebensmittelsicherheit)
EMA	European Medicines Agency (Europäische Arzneimittelbehörde)
EMS	Electronic epidemiological reporting system (Elektronisches epidemiologisches Meldesystem)
ESAC-Net	European Surveillance of Antibiotic Consumption Network
ESBL	Extended spectrum beta-lactamase
ESVAC	European Surveillance of Veterinary Antimicrobial Consumption
EU	Europe/European (Europa, europäisch/-e)
EUCAST	European Committee on Antimicrobial Susceptibility Testing
HIV	Human immunodeficiency virus (Humane Immundefizienz-Virus)
MDR	Multidrugresistance
MHK	Minimum inhibitory concentration (Minimale Hemm-Konzentration)
MRSA	Methicillin-resistant Staphylococcus aureus (Methicillin resistenter Staphylococcus aureus)
NNRTI	Non-nucleoside reverse transcriptase inhibitors (Nichtnukleosidische Reverse-Transkriptase-Inhibitoren)
NRTI	Nucleoside reverse transcriptase inhibitors (Nukleosidische Reverse-Transkriptase-Inhibitoren)
NRZ	National Reference Centre (Nationale Referenzzentrale)
NRZM	National Reference Centre for meningococci (Nationale Referenzzentrale für Meningokokken)
NRZS	National Reference Centre for salmonella (Nationale Referenzzentrale für Salmonellen)
OIE	World Organization for Animal Health (Weltorganisation für Tiergesundheit)
QGV	Quality Poultry Association (Qualitätsgeflügelvereinigung)
RNA	Ribonucleic acid (Ribonukleinsäure)
TB	Tuberculosis (Tuberkulose)

TDR-Tuberkulose	Totally drug-resistant tuberculosis
VET	Veterinary sector (Veterinärbereich)
VRE	Vancomycin-resistant enterococci (Vancomycin resistente Enterokokken)
WHO	World Health Organization (Weltgesundheitsorganisation)
XDR-Tuberkulose	Extensively drug-resistant tuberculosis

INTRODUCTION

The present abridged version of AURES 2013 has arisen from the long version of AURES 2013, an inter-sectoral cooperation in human medicine, veterinary medicine and the food sector. Objective of the AURES 2013, as already of the reports of the previous years, is the sustainable and comparable representation for Austria of representative data on antimicrobial resistance and the consumption of antimicrobial agents with special consideration of Austrian characteristic features and development trends over time. The data of the National Reference Centres appointed by the Federal Ministry of Health and the respective projects are shown in separate chapters with own chapter numbering. This transaction manner was chosen to take into account the different approaches used in data collection. Direct comparison with data from veterinary medicine and human medicine fields is only possible to a limited extent at present on account of the use of different test procedures and/or laboratory methods and anti-microbial limit values (epidemiological cut-offs and clinical limit values). The AURES provides data for broad professional discussion and will subsequently contribute to the optimisation of the use of anti-microbial agents in Austria. The present abridged version consists of the summaries of the individual chapters of the AURES. With this, a first introduction to the subject of anti-microbial resistance and a quick overview about the situation in Austria as well as in the EU comparison will be made possible. Details on the individual chapters are found in the long version of AURES 2013.

INITIAL SITUATION

Antibiotics are already being used since decades for the treatment and prevention of infectious diseases and infections. The use of anti-microbial medicine has highly contributed to the improvement of the state of health of human beings and animals.Antibiotics are indispensable in modern medicine and procedures, such as for example transplants, chemotherapy against cancer or orthopaedic surgery, could not be performed without their use. However, an increasing occurrence of resistant microorganisms is associated with their wide application. The EU-health ministers adopted a declaration in 2012 in which it is stressed that this increasing antibiotic resistance in Europe and worldwide is an increasing health problem for human beings and animals, leading to limited or inadequate treatment options and therefore diminishing the quality of life [1]. The World Health Organization (WHO) had chosen in 2011, for the World Health Day on 7. April, the topic of "Antimicrobial resistance: no action today, no cure tomorrow" [2]. Since 2008, the European Antibiotic Awareness Day is held annually, on 18. November, with the objective to inform population and professional circles about the prudent use of antimicrobially active agents.

In human medicine, the use of antibacterial agents for the treatment of viral infections, the unjustified use of agents with extremely wide action spectrum, too long "prophylactic" use of antibiotics in surgical interventions and the use of antibiotics in case of mere colonization (and not infection) of the patients are considered as the essential causes of the resistance problem. Besides, patients (for children, their parents) with therapy demands contribute to the improper use of antibiotics. The causal relationship of antibiotics use and resistance formation in bacteria can be demonstrated for both infections in patients of medical practitionersas well as nosocomial infections [3]. Already in the Council Recommendation of 15. November 2001 for the prudent use of antimicrobial agents in human medicine, the member states were asked to ensure that specific strategies for the prudent use of antimicrobial agents are available in human medicine and are implemented with the objective to limit the increase of the microorganisms resistant to these agents [4].

Attempts to reduce resistance development through rationalantibiotics use in private practice are found throughout Europe [5]. The efforts are directed, on this occasion, above all towards the renunciation of antibiotic use with the treatment of viral infections. The fact that high quality microbiological diagnostics is not available everywhere in Austria makes it difficult for the physicianin many cases to come toa clear differentiation between infections requiring treatment and those that do not require antimicrobial therapy and, in addition, only a very broad anti-microbial therapy can often be done initially. This results in unnecessary antibiotic use and the preferential use of agents with extremely wide action spectrum: both factors that promote the development of antibiotic resistance on account of the immanent selection pressure. Through the improved treatability of viral diseases drug-resistant viruses are also becoming increasingly important. The biggest hazard caused by drug-resistant viruses is currently posed by HIV infection. This leads to limited or missing efficacy of anti-retroviral therapy with patients already in treatment as well as with people who become infected with these resistant viruses.

In hospital, and here above all in the intensive care units, multiresistant hospital pathogens are already an everyday problem. The combination "immunocompromised" patients, intensive and prolonged antibiotics use as well as transmission of germs between patients, results in the occurrence of infections with multiresistant pathogens that are sometimes not responding to antibiotic therapy anymore. In the document "WHO Global Strategy for Containment of

Antimicrobial Resistance“ hospitals are referred to by the World Health Organization as "a critical component of the antimicrobial resistance problem worldwide“[6].

Although it applies unchanged that "Most of the problems with resistance in human medicine are correlated to use of antimicrobials in humans“, it is today beyond of questionthat antibiotic resistance also has significance in the field of foods of animal origin [7, 8]. The Panel on Biological Hazards (BIOHAZ) of the European Food Safety Authority (EFSA) has in the year 2008 alreadyrecommended the development and implementation of specific measures for the control of raw poultry, pork and beef , whereby measures to combat antibiotic resistance were classified as a priority [9]. In the veterinary field, compulsorymonitoring of the prevalence of zoonoses and selected zoonotic agents as well as their susceptibilityto antimicrobial agents in the livestock population of Austria is being carried out in Austria already since 2004 (in the form of randomised sampling schemes in healthy slaughtered animals - cattle, pork, poultry [10]. The OIE (World Organisation for Animal Health) has also developed recommendations to combat antimicrobial resistance - designed to protect animal health and food safety [11]. Specifications exist for the harmonisation of national programmes concerning the monitoring of antibiotics resistance and detecting of antibiotics volume flows, recommendations on the responsible use of antibiotics in veterinary medicine and on risk assessment of antibiotics resistance through the treatment of animals as well as for laboratory methods for the detection of antibiotic resistance.

Coordinated measures to contain the spreading of antimicrobial resistance need surveillance systems. Only then is it possible to assess how local and global resistance situations react to a changed antibiotics use and new infection control measures. In the human medicine sector, many Austrian hospitals are taking part in the European system for monitoring antimicrobial resistance ("European Antimicrobial Resistance Surveillance Network“ [EARS-Net]) and in the "European Surveillance of Antibiotic Consumption Network“ (ESAC-Net). EARS-Net and ESAC-Net are surveillance programmes initiated by the community and confirmed in terms of their significance through the EU Council, under which standardized, harmonized and comparable human medicine data about the resistance to bacterial pathogens and/or the use of antibiotics are collected [1].

Today, the increasing antibiotic resistance of human pathogen agents represents a problem which requires a willingness by all sectors involved (human medicine, veterinary medicine, primary livestock production, food processing and food preparation, consumers) to exercise the responsibility in their respective area of influence for ensuring that the emergence and spreading of antimicrobial resistance is contained. The Council of the European Union stressed in June 2012, that the awareness among the general public as well as in the human and veterinary medicine field for the dangers of antibiotic resistance must be actively honed [1]. The present Summary Report makes available to the public the data determined within the scope of the nationwide resistance surveillance in a concise version.

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Antimicrobial resistance in selected bacterial invasive infectious pathogens

Data from the human sector

An activity by the National Reference Centre for nosocomial infections and antimicrobial resistance within the scope of participation in the European Antimicrobial Resistance Surveillance Network (EARS-Net)

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European Antimicrobial Resistance Surveillance Network (EARS-Net)

The Austrian EARS-Net data represent a data base illustrating 139 Austrian hospitals. The resistance rates of the invasive indicator pathogens, hence, constitute a reliably measured substitute value for the prevalence of the pathogens analysed. As it concerns antimicrobial susceptibility testing methodology, Austrian microbiology laboratories switched from CLSI to EUCAST consecutively in 2011, a process that was successfully completed in 2012. The Austrian results may be summarised for 2013 as follows:

In the case of **S. pneumoniae** there was again a very positive situation. Only 1 invasive isolate proved to be not resistant to penicillin in the year 2013 (0.3%). The situation of resistance in regard to macrolides, which has amounted to 17% in 2012, shows a notable decrease to 10% in 2013. The three most frequent serotypes of invasive isolates in the year 2013 were **3, 14 and 7F**. With children younger ≤ 2 years, type 19A was the most frequent one. In the age group of 60+, the most frequent serotypes were 3, 14, 19A and 6C.

Since 2009 the **MRSA-rate** shows again an upward trend and was 9.1% in 2013. No reduced sensitivity to (resistance against) vancomycin was detected in the year 2013 in any invasive S. aureus isolates.

With **enterococci** no change of the resistance rates against aminopenicillin and aminoglycosides in comparison with the years before was detected. The **VRE** rate was still below 1% with E. faecalis and was 6.0% with E. faecium.

In case of **E. coli** the resistance rates of aminopenicillins (51%) and fluoroquinolones (22%) remained unchanged since 2009. In relation to 2011 the resistance rates of 3rd generation cephalosporins (from 9.0% to 9.9%) and aminoglycosides (from 6.3% to 7.0%) were increasing. The ESBL rate in 2013 was 16.7%.

With **K. pneumoniae** a sudden increase of the resistance rates was registered in 2010, which had not been observed to this extent since the data collection of 2005 in EARS-Net and which related to the fluoroquinolones, the 3rd generation cephalosporins and the aminoglycosides. In relation to 2012 the resistance rates of fluorochinolones (from 15.1% to 15.8%) and aminoglycosides (from 4.6%to 4.8%) were increasing. The resistance rate of 3rd generation cephalosporins decreased from 11.5% to 10.7%. The ESBL rate 2013 remained as high as 2012 with 15.9%.

Carbapenemase producing isolates: In 2013 1 E. coli isolate and 13 K. pneumoniae isolates were detected in blood culture specimens.

With **P. aeruginosa** a decrease of the resistance rates in connection with the following substance classes was recorded in 2013: ceftazidime 9.5% (-4.6%), piperacillin/tazobactam 13.3% (-4.2%), aminoylcosides 7.4% (-1.8%) and carbapenems 12.3% (-2.2%) with the exception of the resistance for fluorochinolones with 15.2% (+0.6%).

Acinetobacter sp. showed resistance rates against aminoglycosides for 9.8%, against fluorochinolones for 21.6% and against carbapenems for 13.7%. Only 51 isolates were reported.

In total, there is still a positive and stable situation detectable in Austria, especially with nosocomial gram-positive pathogens like MRSA and VRE. Compared to other European countries, the resistance rates are low. A rather growing problematic field are the gram-negatives.

The full report can be found in the long version of the AURES 2013 from page 16 to page 88 (AURES 2013).

Resistance report for selected non-invasive pathogens

Data from the human sector

An activity of the working group resistance reporting

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The collected data of eleven centers/laboratories from all over Austria are highly reliable and represent the prevalence of antibiotic resistance of selected so called 'non-invasive isolates' from 2008 to 2013. The aim of this annual survey is also to highlight the difference in resistance rates comparing „hospital derived isolates" with „community-derived isolates", gained from out-patient-clinics. We report resistance-rates for the following „indicator-organisms" for 2013:

1. ***Group A streptococci*** (n=2,515) from the lower and upper respiratory) tract demonstrated lower resistance rates for macrolides compared to ***pneumococci*** (n=1,394) in both out- and in-patient settings (4.6%/9.1% versus 18.4%/16.6%). Pooled resistance rate for macrolides in pneumococci is above resistance of invasive pneumococci of EARS-net AT data: 17,5% versus 10%. Resistance rates in H. influenza (n=2,846) in hospitals and the community are as follows: aminopenicillins 17.8% and 20.6%; aminopen. + betalactamaseinhibitor 8.3% and 6.1%, fluoroquinolones 0.1% respectively.
2. **ESBL-producing *E. coli*** (n=2,837) from urine samples remain stable with 6.7% over the last two years and do not differ whether gained from samples in (7.3%) or outside (6.7%) the hospital. Fluoroquinolones proved to have high resistance rates in all E. coli isolates (16.6%, n=43,564) and very high in ESBL-positive E. coli (74.5%) and sulfamethoxazol/trimethoprim demonstrated similar results (25.2% vs 71.5%).
3. ***Klebsiella pneumoniae*** (n=9,901) from urine samples showed a resistance rate against 3rd generation cephalosporins of 7.5% and a carbapenem resistance of 1.2% in 2013.
4. ***Staphylococcus aureus*/MRSA** (n=19,194/1,233): hospital associated MRSA rate was 6.7%, in out-patients the MRSA rate was 4.0%.There were no isolates identified resistant to linezolid or vancomycin.
5. ***Pseudomonas aeruginosa***: Stable high resistance rates of all selected substances for isolates from deep respiratory tract (as a surrogate for isolates from the ICU; n=971):

Carbapenems showed a rate of 14.9% and Ceftazidim 13.3%. Ear-derived isolates (as a surrogate for external otitis; n=1,391) showed a decreasing rate of 7.0% to 3.5 for aminoglycosides.

The full report can be found in the long version of the AURES 2013 from page 89 to page 101 (AURES 2013).

Resistance report *Neisseria meningitidis*

An activity of the Austrian Agency for Health and Food Safety at the Institute for Medical Microbiology and Hygiene Graz

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In 2013, the National Reference Centre for Meningococci received 76 reculturable isolates. Of these isolates, 39 were from invasive infections. The serogroups of all isolates are distributed in the following manner: 42.1% serogroup B, 21.1% serogroup C, 27.6% polyagglutinable isolates, 5.3% serogroup Y, 2.6% serogroup W, and 1.3% serogroup X. According to EUCAST, five isolates were resistant to penicillin, and further 34 isolates showed decreased susceptibility to penicillin. None of the strains sent to the Reference Centre in 2013 were resistant or had decreased sensitivity to ceftriaxone, rifampicin or ciprofloxacin.

The full report can be found in the long version of the AURES 2013 from page 102 to page 107 (AURES 2013).

Resistance report *Campylobacter*

Data from the human and food sector

An activity of the National Reference Centre for Campylobacter/the National Reference Laboratory for Campylobacter from food and feed products

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In 2013, a total of 5,726 cases of campylobacteriosis was reported in Austria (data source: EMS/NRC as of April 23, 2014). Again, a high to very high tetracycline and fluorochinolone resistance rate, respectively, were found in C. jejuni and C. coli isolates of human and broiler meat origin. Resistance to fluorochinolones is most prominent in Campylobacter spp. Resistance to three or more antimicrobial classes is primarily observed in C. coli. Over the last years resistance to fluorochinolones in human isolates has stabilized at a very high level with an average of 59.3% and 68.6% in C. jejuni and C. coli, respectively. Tetracycline resistance is found to be 28.7% in C. jejuni and 36.2% in C. coli on the average with major annual fluctuations. In 2013, no resistance to

macrolides was observed. Mean resistance towards erythromycin is 0.3% and 6.3% in C. jejuni and C. coli isolates of human origin, respectively.

The full report can be found in the long version of the AURES 2013 from page 108 to page 118 (AURES 2013).

Resistance report *Salmonella*

Data from the human, food and veterinary sector

An activity of the National Reference Centre for Salmonella

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In 2013 a decrease of 20.8% in the number of primary human isolates sent to the National Reference Centre for Salmonella was registered.

Due to the decline of fully susceptible S. Enteritidis isolates there has been a shift towards higher resistance rates in recent years in Austria. The highest resistance rates are found against ampicillin, streptomycin, sulphonamides and tetracyclines (resistance pattern typical for multiresistant S. Typhimurium strains) and against nalidixic acid (typical for S. Infantis, S. Stanley, and several S. Enteritidis phage-types).

High level resistances against ciprofloxacin and third generation cephalosporins (cefotaxime) were still extremely rare.The resistance rates among non-human salmonella isolates are partly considerably higher than those among human strains.

The full report can be found in the long version of the AURES 2013 from page 119 to page 132 (AURES 2013).

Resistance report Shigella

Data from the human sector

An activity of the National Reference Centre for Shigella

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In Austria 70 cases of shigellosis were reported to the health authorities in 2013. In the same year, a total of 69 Shigella isolates were received by the National Reference Centre for Shigella. The incidence rate was 0.82/100,000, in 2012 an incidence of 0.68/100,000 inhabitants was registered. The predominant species was Shigella sonnei accounting for 65.2% of all isolates. Resistance testing revealed no strains sensitive against all substances tested. We detected resistance against

Ciprofloxacin in 16 strains and resistance to nalidixic acid in 28 isolates. Eight Shigella strain were ESBL positive (11.6%).

The full report can be found in the long version of the AURES 2013 from page 133 to page 140 (AURES 2013).

Resistance report Yersinia

Data from the human sector

An activity of the National Reference Centre for Yersinia

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In 2013, the Austrian National Reference Centre for Yersinia examined 178 isolates of Yersinia spp., of which 176 were of human origin, and two from food samples. Of the 176 human isolates, 111 were pathogenic, 65 were non-pathogenic isolates. Among the pathogenic isolates 107 belonged to Yersinia enterocolitica and four strains to Y. pseudotuberculosis. In 2013, the incidence rate for cases confirmed by the National Reference Centre was 1.32 per 100,000 inhabitants. In vitro susceptibility testing revealed no abnormalities – 22 Y. enterocolitica isolates showed resistance to amoxicillin/clavulanic acid, six showed intermediate resistance to gentamicin.

The full report can be found in the long version of the AURES 2013 from page 141 to page 146 (AURES 2013).

Resistance report Tuberculosis 2013

Data from the human sector

An activity of the National Reference Centre for tuberculosis

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In 2013, a total of 649 cases of tuberculosis (462 confirmed, 43 probable and 124 possible cases) were reported in Austria giving an incidence of 7.66/100,000 population compared to also 7.66/100,000 population in 2012. The decreasing trend since 1997 in TB incidence among Austrians continued in 2013 (2013: 4.20/100,000 persons with Austrian nationality; 2012: 4.40/100,000; Reduction: 4.8%). The TB incidence in the population with non-Austrian nationality did not change significantly from 2012 to 2013 (2013: 33.1/100,000 persons with non-Austrian nationality; 2012: 33.7/100,000). A total of 16 cases of MDR-TB (including 3 cases of XDR-TB) – two of which were Austrian – were identified at the national reference centre of TB in 2013.

The full report can be found in the long version of the AURES 2013 from page 147 to page 156 (AURES 2013).

Resistance report Yeasts

Data from the human sector

An activity of the National Reference Centre for Yeasts

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Up to now resistance in Candida doesn't seem to be a real threat. In general, the situation in Austria is in concordance with globally reported data. C. glabrata is still the most resistant species to azoles. With the exception of C. krusei other Candida species were nearly always susceptible. Echinocandin resistance has been a rare phenomenon. Only a minor number of C. albicans strains has been identified as resistant. As was the case in 2012 a higher number of resistant C. glabrata strains was detected. In addition, as last year an unusual high number of micafungin-resistant strains was observed. As these strains were susceptible to anidulafungin, which may be used as an indicator for all echinocandines it remains to be seen if the breakpoint's concentration established by EUCAST is too low. However, this question can only be answered using specific molecular methods.

The full report can be found in the long version of the AURES 2013 from page 157 to page 177 (AURES 2013).

Resistance report Mould

Data from the human sector

An activity of the National Reference Centre for Mould

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Invasive mould diseases have become increasingly common as opportunistic infections. Candida and Aspergillus species are the most important pathogens. 76 moulds out of sterile body sites and bronchoalveolar lavages were collected from the Medical University Vienna, Department of Laboratory Medicine, the Medical University Innsbruck, Division of Clinical Microbiology, the analyse BioLab GmbH of Linz and the County Hospital of Salzburg in 2013. Aspergillus species, which were isolated in 76%, are still the leading causative agents of invasive mould diseases; thereof 80% belong to Aspergillus fumigatus complex.

In contrast to the previous year (only one Aspergillus ustus-isolate showed resistance to posaconazole), 2 Aspergillus fumigatus isolates were intermediate susceptible and 1 Aspergillus fumigatus-, 1 A. flavus- and 1 A. nidulans isolate were resistant to amphotercin B, respectively. 2 Aspergillus fumigatus isolates were intermediate susceptible to posaconazole.

Among non-aspergillus-isolates elevated MIC´s above 1µg/ml for amphotericin B, above 0,125µg/ml for posaconazole and above 1µg/ml for voriconazole were detected in 59% (13 of 22 isolates), 68% (15 of 22 isolates) and 14% (3 of 22 isolates), respectively. It must be pointed out that clinical breakpoints are only available for Aspergillus species and interpretation of susceptibility testing of non aspergillus moulds is based on aspergillus specific data.

The full report can be found in the long version of the AURES 2013 from page 178 to page 183 (AURES 2013).

Resistance report of the Austrian HIV Cohort Study Part 1: Transmission of drug-resistant HIV in Austria

An activity of the association "Austrian HIV Cohort Study “

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Prevalence of Transmitted Drug Resistance is Stabilising at a Low Rate in Austria

Strickner S.[1], Leierer G.[2], Rieger A.[3], Steuer A.[4], Sarcletti M.[2], Geit M.[5], Haas B.[6], Taylor N.[7], Kanatschnig M.[8], Zangerle R.[2], for the AHIVCOS Study Group

Objective: To determine the prevalence of transmitted drug resistance (TDR), temporal trends in resistance, and predictors for TDR.

Method: Newly diagnosed patients from 2001 to December 2013 from seven centres were analyzed. Mutations were judged as resistant according to Bennett et al. (WHO 2009 mutation list). For patients with acute or recent infection the year of infection was obtained by the date of primary HIV infection or the median point in time between negative and positive HIV test. For patients with chronic infection the rate of resistance was plotted against the year of the HIV test.

Results: Overall 2,510 of 4,064 patients had a resistance test (in 92 samples RNA could not be amplified). The overall prevalence of TDR was 7.3% (183 of 2510 patients; 95% CI: 6.3%-8.4%). In the CASCADE-centers, the prevalence of NRTI resistance was 3.8% (3.0%-4.7%), the prevalence of NNRTI resistance was 2.1% (1.5%-2.9%), and the prevalence of PI resistance was 2.4% (1.8%-3.3%). The relative risk of TDR in men who have sex with men compared to heterosexual contacts was 1.5 (95% CI: 1.0-2.1). Compared to men, women had a slightly lower relative risk of TDR (0.6; 95% CI: 0.4-0.99). The prevalence rate of TDR in the 503 patients with acute/recent infection was 8.7% (32 of 367 patients; 6.2%-12.1%). One patient (0.3%) showed TDR against 3 drug classes (K70R; K103N; L90M). The prevalence rate of TDR in the 2,444 patients with chronic infection was 7.5% (108 of 1,438 patients; 6.3%-9.0%).

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Conclusions: The prevalence of TDR among newly diagnosed patients was found to be stabilizing. No difficult to treat cases of TDR has been observed.

The full report can be found in the long version of the AURES 2013 from page 184 to page[1] 194 (AURES 2013).

Resistance report of the Austrian HIV Cohort Study part 2: Resistance development under antiretroviral therapy

An activity of the association "Austrian HIV Cohort Study "

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Prevalence of Development of Drug Resistance in HIV infected patients in Austria

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Objective: To determine the prevalence of development of drug resistance, predictors and temporal trends in resistance.

Method: Patients who have ever been on antiretroviral therapy (ART) from seven centres were analyzed. Mutations were judged as resistant according to "Update of the Drug Resistance Mutations in HIV-1: March 2013" from the International AIDS-Society-USA (http://iasusa.org/resistance_mutations/mutations_figures.pdf).

Results: Overall 3,885 patients have ever received ART, 3,850 of them currently. 1,069 had a resistance test after ART (27.5%). The overall prevalence of development of drug resistance was 91.9% (982 of 1,069 patients), the prevalence of NRTI resistance was 45.8%, the prevalence of NNRTI resistance was 33.9%, and the prevalence of PI resistance was 85.3%. The prevalence of 3-class-resistance was 23.3% (249 of 1,069 patients). The risk factors for developing a

3-class-resistance were a CD4 nadir <50 (OR=3.5; 95% CI: 2.4-5.1), a CD4 nadir between 50 and 200 (OR=1.9; 95% CI:

1.3-2.7) and initial therapy before 1997 (OR=28.2; 95% CI: 18.1-43.8) as well as from 1997 to 2003 (OR=7.9; 95% CI: 5.1-12.2). The risk to develop a 3-class-resistance was slightly lower in female patients infected through intravenous drug use (OR=0.5; 95% CI: 0.2-0.9) and in patients with a low viral load (for <400 copies/ml OR=0.2; 95% CI: 0.1-0.5).

Conclusions: The overall prevalence of development of drug resistance is at a rather high level, while the prevalence of 3-class-resistance was found to be stabilizing at a low level. The risk for developing a 3-class-resistance after ten years of combination ART was below 10%.

The full report can be found in the long version of the AURES 2013 from page 195 to page 211 (AURES 2013).

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Antibiotic resistance for selected zoonotic and indicator bacteria

Data from the veterinary sector, 2013

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Integrative risk assessment, data and statistics (DSR)

Participating authorities and institutions

Project

Durchführungserlass Zoonosenmonitoring 2013 - Überwachung ausgewählter Zoonosen und Antibiotikaresistenz (BMG-74600/0314-II/B/10/2012)
BMG – Bundesministerium für Gesundheit
Abteilung II/B/10: Tiergesundheit, Handel mit lebenden Tieren und Veterinärrecht
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Sample monitoring for sampling at chicken slaughterhouses

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Sampling

Done in 41 selected slaughterhouses in Austria by appointed veterinary practitioners and public veterinary officers

Primary isolations and differentiations

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In accordance with the EU-Directive 2003/99/EC, the Federal Ministry of Health in co¬operation with the Austrian Agency for Health and Food Safety (AGES) and veterinary practitioners conducts annual programs in order to monitor the prevalence and the antimicrobial resistance of certain zoonotic and indicator bacteria in different Austrian farm animal species. In 2013, thermotolerant Campylobacter and indicator E. coli from intestinal contents of slaughtered healthy calves under 8 months of age, young cattle until 2 years of age, and bovines over 2 years of age as well as fattening pigs and broiler slaughter batches that were collected on the basis of a randomized sampling plan were analyzed in the department for Veterinary Microbiology of the AGES Institute for Medical Microbiology Hygiene in Graz.

Salmonella were isolated from flocks of laying hens, broilers, and fattening turkeys in official veterinary laboratories according to the national control plan for Salmonella. Typing and antimicrobial susceptibility testing using micro dilution assays was performed in the respective national reference laboratories of the AGES. The obtained data of the analyses were interpreted and reported by the statistics department of the AGES applying the EUCAST epidemiological cut-off values (microbiological resistance) and clinical breakpoints.

Campylobacter spp.: Thermotolerant Campylobacter was isolated from 183 out of 328 broiler slaughter batches (56%). In 44% of samples from broilers C. jejuni were detected and in 12% C. coli. Compared to previous years, no significant changes in prevalence of Campylobacter spp. could be found.

Campylobacter jejuni: In 2013, the rate of fully sensitive isolates increased from 19% in 2012 up to 26%. While microbiological resistance to ciprofloxacin and ampicillin was lower com¬pared to 2012 a significant increasing tendency could still be observed in resistance rates against those substances. Resistance rates to quinolones (ciprofloxacin and nalidixic acid), and ampicillin were found to be “high” to “extremely high” (73%, 71% and 34%) and “high” to tetracycline (25%).

Campylobacter coli: Ninety seven percent of the isolates from broilers were resistant to one or more out of five representative antibiotics (2012: 82%). Resistance rates were found to be highest towards tetracycline (84%); compared to C. jejuni, lower rates of resistance were detected towards quinolones (48%). Resistance rates to the other antibiotics tested were similar in both campylobacter species.

E. coli: Eighty four percent of isolates from broilers and 70% from fattening pigs showed resistance to one or more antibiotics out of nine tested representative antibiotics, but only 31% of the isolates from calves, 12% from cattle over 2 years, and 7% from young cattle under 2 years.

Highest resistance rates could be found towards fluoroquinolones in isolates from broilers (65%), towards streptomycin and tetracycline (57% and 53%) in isolates from pigs, and towards sulphonamides and ampicillin (38% each), and streptomycin (53%) again in in isolates from broilers.

Salmonella spp.: Twenty eight percent of Salmonella isolated from laying hens, 49% from broilers and 78% from turkeys showed microbiological resistance to one or more antibiotics out of nine representative antibiotics tested. Very high to extremely high resistance rates were found in certain serotypes, e.g. in

S. Infantis, S. Kottbus, S. Stanley or S. Typhimurium. All isolates of S. Kottbus from broilers and of S. Infantis,

S. Mbandaka, S. Saintpaul, and S. Stanley from turkeys showed resistance towards one or more antibiotics out of nine representative antibiotics tested.

The full report can be found in the long version of the AURES 2013 from page 212 to page 331 (AURES 2013).

European Surveillance of Veterinary Antimicrobial Consumption (ESVAC)

An activity of AGES – Agency for Health and Food Safety
Department data, statistics and risk assessment

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In this study data on sales of veterinary antimicrobials in 2012 in Austria were collected in a standardized manner according to the recommendations of the European Surveillance of Veterinary Antimicrobial Consumption (ESVAC) project.

In 2012, the total sales of active ingredients in Austria for cattle, pigs, poultry, sheep and goats equals 53.22 tons (t), a reduction of 0.4% compared to 2011. The largest amount of the veterinary antimicrobials sold were antimicrobials for systemic use (50.88 tons, 95.6%). Oral preparations – this group includes oral powders, oral solutions, tablets and oral pasta – are with 43.90 tons (82,5%) still the most used application form. Parenteral preparations are on second place with 5.36 tons (10.1%), follow by premix with 2.37 tons (4.5%). Within the group for systematic use 56.1% (29.87 tons) were tetracyclines (QJ01A), followed by beta-lactam-antibiotics - penicillins (QJ01C; 12.7% respective 6.48 tons) and macrolides, lincosamides and streptogramines (QJ01F; 10.0% respective 5.09 tons).

The full report can be found in the long version of the AURES 2013 from page 332 to page 338 (AURES 2013).

ESAC-Net – European Surveillance of Antimicrobial Consumption Network

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Since 1998 the level of antimicrobial use expressed in prescriptions per 10.000 inhabitants remained stable. As compared to the other European countries, Austria shows a moderate use of the overall antibiotic consumption.

Until 2009 a continuous increase of the consumption of penicillins has been observed, mainly aminopenicillins with beta-lactase inhibitors. In relation to 2012 the consumption has notably increased (from 6.5 to 7.6 prescriptions per 10,000 inhabitants per day).

The consumption of cephalosporins has remained stable within the last ten years. Since 2009 the use of third generation cephalosporins has steadily decreased (from 1.5 to 1.2 prescriptions per 10,000 inhabitants per day). Since 2002 the consumption of second generation cephalosporins shows an ongoing increase (from 0.7 to 1.2 prescriptions per 10,000 inhabitants per day).

The consumption of tetracyclines, most notably of doxycyclines, has been decreasing continuously for years. Attention shall be paid to the fact that especially in that group the price is lower than the prescription charge. Therefore, eventually not all prescriptions are included in the consumption data.

In relation to 2012 there was an increase of the consumption of macrolides, lincosamides and streptogramins. Mainly macrolides are responsible for the increase (from 3.7 to 4.1 prescriptions per 10,000 inhabitants per day in 2013).

Until 2006 the consumption of sulphonamides with trimethoprim has continuously decreased and remained stable at 0.3 prescriptions per 10,000 inhabitants per day. Also in this group the price is below the prescription charge, and eventually not all prescriptions are included in the consumption data.

The consumption of quinolones had notably increased until 2004, and has then remained stable within the last years. In relation to 2011 consumption increased from 2.0 to 2.2 prescriptions per 10,000 inhabitants per day with ciprofloxacin and moxifloxacin constituting the main part.

The full report can be found in the long version of the AURES 2013 from page 339 to page 352 (AURES 2013).

Resistance report *Erwinia amylovora*

An activity of AGES –Austrian Agency for Health and Food Safety
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Fire blight is caused by the plant pathogenic bacterium Erwinia amylovora. The use of streptomycin as a plant production agent constitutes one part of the Austrian strategy to combat this plant disease in fruit growing. 171.2 ha of pome fruit area were treated with plant protection products containing streptomycin in 2013. The total amount of applied plant protection products was 112.6 kg.

In order to determine the prevalence of streptomycin resistant E. amylovora strains at an early stage, surveillance activities have been carried out since 2006. Up to date, all E. amylovora isolates from treated orchards have been tested as susceptible to streptomycin. The comparison of the distribution of minimum inhibitory concentrations between wild-type strains and test-strains did not reveal any shifting of the sensitivity range of the test isolates.

To evaluate a possible impact of the usage of streptomycin against fire blight on the susceptibility of bacteria, E. coli isolated from bovine intestines is used as indicator. Since 2004, indicator bacteria have been isolated from intestines of slaughtered bovines, pigs and broilers all over Austria, and tested for their susceptibility to several antimicrobials. From 2004 to 2011, the resistance rates in indicator E. coli to streptomycin have not changed significantly; the increase of resistance 13% in 2012 and 2013 is due to methodology. Based on the current information no impact can be observed on the trends of resistance in commensal E. coli from bovines and a reassessment of streptomycin in plant production is currently not necessary.

The full report can be found in the long version of the AURES 2013 from page 353 to page 361 (AURES 2013).

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Table 2: Contribution summary, with authors and reviewers

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