

## Consequences of careless use

### Antibiotic resistance – a man-made problem

**Antibiotics are indispensable for the treatment of bacterial infectious diseases but in recent decades they have lost their efficacy. Incorrect applications, inappropriate and over-prescription are causing resistances worldwide. Diseases caused by common germs such as E.coli or Staphylococcus aureus often remain resistant to treatment. There are no new antibiotics.**

Over several decades antibiotics have been used in a careless and wasteful manner all over the world. In the 1980s, for example, preparations containing antibiotics were marketed as a cure for diarrhoea. The WHO warned at the time that this reckless application must be prevented, and not only because antibiotics are generally useless against diarrhoea, but because they are expensive and can also cause damage.<sup>1</sup> More than 160 companies from various countries were involved including German companies such as Grünenthal, Boehringer Mannheim, Nattermann, E. Merck and Hoechst. The Grünenthal company, for example, was marketing the diarrhoea remedy Entero Sediv in the 1980s. It was never sold in Germany, but instead massively advertised in the Global South. It contained two high-risk antibiotics in the form of dihydrostreptomycin and bacitracin. The product also contained kaolin and pectin which can only thicken the stool without preventing the loss of fluid that makes diarrhoea such a threat. A particularly problematic aspect was the addition of Cloiquinol, a drug that was implicated in connection with the SMON scandal: many thousands of people – particularly in Japan, where the drug was massively consumed – suffered serious nerve damage with paralisations and loss of sight. In some cases Cloiquinol proved fatal.<sup>2,3</sup>

### Marketing at any price



"Don't lose time when treating respiratory infections in adults." Advertisement for Avelox® (Moxifloxacin) from MIMS Africa 6 2002. The substance is actually only intended for use when standard antibiotics fail.

Drugs manufacturers are not interested in the mindful and sustainable use of their products: what is important is successful advertising and the resulting high sales figures. In 1998 Hoechst presented its antibiotic Cefatoxim (Claforan®) with the slogan: "How many antibiotics do you need? One. Claforan." The relatively new antibiotic preparation at the time was actually only intended as a reserve when other antibiotics were not effective.<sup>4</sup>, for example Acithromycin, an antibiotic which can be used to treat middle ear infections in children. The campaign was successful. Sales in 2002 amounted to one billion US dollars. Pfizer had to pay a fine of 6 million US \$ due to misleading representation of the efficacy of the drug<sup>5</sup> but this did not discourage the company. Ten years later it had to pay another fine, this time 43 million US dollars. Pfizer had claimed

<sup>1</sup>Pharma-Brief (1984) Bittere Pillen für die Dritte Welt, Nr. 4

<sup>2</sup>Pharma-Kampagne (1984) Durchfall? Todesursache Nr. 1

<sup>3</sup>Tiranti D (1981) The Devil's Alternative. New Internationalist <http://newint.org/features/1981/01/01/devils/>

<sup>4</sup>Pharma-Brief (1998) Gefährliche Verschwendung – Antibiotikagebrauch und Resistenzentwicklung. Nr.7, S.1

<sup>5</sup>Petersen M (2003) Pfizer Settles an Inquiry Into Ads for an Antibiotic. The New York Times, 7 Jan

that Linezolid (Zyvox®) was better than the antibiotic Vancomycin, without being able to provide evidence from studies.<sup>6</sup>

Advertising for antibiotics, for example in medical journals, encourages the most widespread possible use, but does not mention resistance problems and even aggravates them.<sup>7</sup> This is because antibiotics should only be used as a reserve in order to maintain their efficacy for as long as possible.

The massive advertising of antibiotics over many decades has encouraged their uncritical use particularly in developing countries and has led to major resistance problems.<sup>8</sup> A systematic study carried out in New Delhi highlights this: around forty percent of all patients in public and private practices were prescribed an antibiotic. Particularly in private practices this often included new and broad-spectrum antibiotics. The frequent prescription of Fluoroquinolone against diarrhoea was particularly misguided.<sup>9</sup>

### Poverty promotes the development of resistance

Poverty also contributes to the situation where patients will purchase a drug directly without paying to see a doctor first. Due to a lack of state regulation in many poor countries, antibiotics are available over the counter, in the marketplace or street corner without prescription. Often the vendors as well as the customers do not know whether and when which antibiotic is appropriate, or how long and in what dose the tablets have to be taken. There are other factors contributing towards the rise of excessive or inappropriate prescription of antibiotics. This is shown in a study on antibiotics use on the Mexican-American border. Many Americans who live near the Mexican border take advantage of being able to buy their own antibiotics as these are cheaper than in the US. The ability to buy antibiotics without prescription is particularly attractive for low-income, non-health-insured US citizens.<sup>10</sup>



### Ignorance promotes the development of resistance

On the other hand, a study in India has shown that the over-prescription of antibiotics is also a problem. Far more antibiotics were prescribed in private clinics than in state health centres and overall more in rural than in urban areas. A lower age of the patients and a high socioeconomic status led to more prescriptions.<sup>11</sup>

<sup>6</sup>Morran C (2012) Pfizer Hit With \$43 Million Settlement For Misleading Marketing Of Drugs. Dec. 12th <http://consumerist.com/2012/12/12/pfizer-hit-with-43-million-settlement-for-misleading-marketing-of-drugs/> [Accessed: 24.4.2015]

<sup>7</sup>Gilad J et al (2005) Antibiotic drug advertising in medical journals. Scandinavian Journal of Infectious Diseases, No 37

<sup>8</sup>Sosa A de J et al. (2010) Antimicrobial Resistance in Developing Countries. Springer

<sup>9</sup>Kotwani A und Holloway K (2011) Trends in antibiotic use among outpatients in New Delhi, India. BMC Inf Diseases; 11, p 99

<sup>10</sup>Homedes N, Ugalde A (2012) Mexican Pharmacies and Antibiotic Consumption at the US-Mexico Border. Southern Med Review Vol 5, Issue 2

<sup>11</sup>Kumar R et al (2008) Antibiotic prescribing practices in primary and secondary health care facilities in Uttar Pradesh, India. Journal of Clinical Pharmacy and Therapeutics, Vol 33, No 6, p 625 - 634

A lack of knowledge in dealing with antibiotics is a decisive factor in the emergence of antibiotic resistance. Doctors who did regular further training prescribed fewer antibiotics overall.<sup>8</sup> This also depends on the type of further training. In a Mexican survey 44% of the employees in pharmacies stated that they often received further training from representatives of the pharmaceutical industry. This is all the more serious given that 91% of the employees did not have professional qualifications. They still advised patients on drugs, including antibiotics, and frequently recommended them.<sup>7</sup>

In poor countries, access to independent drugs information is scarce, and pharmaceutical representatives are often the only 'source of information'. In recent years companies have massively increased their marketing activities. Their representatives visit mainly private practices that have a lot of patients and which thus promise plenty of sales.<sup>12</sup>

### **Production and livestock farming**

Things are already starting to go wrong in the production of antibiotics. In India where these effective substances are produced in large quantities - also for export to industrialized countries - some of the rivers have a higher content of antibiotics than can be found in the blood of patients who have actually taken these drugs.<sup>13</sup>

But it is not only in human medicine, antibiotics are also being used on a massive scale worldwide in livestock farming, often temporarily but also simply to accelerate growth. This leads to the development of resistance in humans and we still do not know to what extent.

### **Conclusion**

The G 7 Summit is also concerned about antibiotic resistance. However, it is not simply enough to free up funding for the development of new effective substances. The problems cannot be solved as long as the widespread misuse is being promoted by unethical advertising, manipulation and misleading information. Fundamentally, it is all about the business model of Big Pharma – because the more frequently a medicament is prescribed, the greater the turnover and profit. In the case of antibiotics, this is a truly health-damaging model. It seems doubtful, however, that the G7 is seriously addressing the causes of the problems.

This is highly controversial in terms of development policy because infectious diseases are a much greater problem for the world's poor. Changes in the way we use antibiotics and in the exploration of new effective substances are a worldwide challenge.

---

<sup>12</sup>Olivier C et al (2010) Containing Global Antibiotic Resistance: Ethical Drug Promotion in the Developing World. In: Sosa A de J. et al. (2010) Antimicrobial Resistance in Developing Countries

<sup>13</sup>Knapton S (2015) Drug companies to blame for antibiotic resistance, says pharmaceutical boss. Telegraph, 18 Jan