



# THE WORLD ALLIANCE AGAINST ANTIBIOTIC RESISTANCE (WAAAR): A MAJOR PLAYER IN THE GLOBAL DRIVE TO PROTECT HUMAN HEALTH

“Our Alliance has several important strengths: a multidisciplinary and multiprofessional structure including veterinary medicine, strong involvement from consumers, participation from politicians, parliamentarians and deputies, global programmes including antibiotic stewardship, infection control, use of old and recent diagnostic tools, research, and upgrading of vaccination programmes, all with the official support from many professional societies, from many different countries and other related bodies. ”

[www.waaar.org](http://www.waaar.org)

## About WAAAR

The Non-Governmental Organization ACdeBMR (*L'Alliance contre le Développement des Bactéries Multirésistantes aux Antibiotiques*) was constituted on 2 December 2011 in France. Subsequently, as its work became more internationally focused, it adopted the English name it is now known by: “The World Alliance Against Antibiotic Resistance” (WAAAR).

WAAAR is registered in Paris, France. From the start it has had strong bonds with French speaking Africa, with many distinguished African supporters, such as Benin’s Minister of Health, Dorothée Kinde Gazard, MD, PhD, who had been very active in the promotion of high quality safe health-care in Africa, and who organized an inter-ministerial conference on that subject (1).

## Board members

The Board Members are Dr Céline Pulcini, Vice-President, Jean-Pierre Hermet, Dr Joel Leroy, Garance Upham, and Dr Jean Carlet, President.

## Membership

The 730 members of WAAAR are physicians, hospital managers, scientific researchers, hygiene nurses, patients and patients organizations, economists and interested

persons, from over 55 countries.

Drawing on the skills and experience of its members WAAAR’s expertise ranges widely from antibiotic stewardship for family physicians and hospital managers, for protecting and prevention control, to water and sanitation to protect populations from the spread of drug resistant bacteria, veterinarians, food quality experts, researchers and representatives of patient and consumer groups.

## The Paris Declaration

In June 2014, the WAAAR initiated the Paris Declaration (see below) which enlisted the support of over 90 scientific societies, up to 145 societies or institutes including ACCP, ATS, CDC-USA, ESCMID, ESICM, IDSA, SCCM, ISID, ISC and SPILF.

WAAAR is among the largest network along with REACT or APUA, of people actively working to make the world safe for human beings in the “post-antibiotic era”, to quote the Director-General of the World Health Organization, Dr Margaret Chan.

## Actions: National and International

### France

Intensive lobbying and meetings with high level officials, resulting in a national Décret sur les Référents, and the

creation of a National Task Force on Antibiotic Resistance.

In January 2015, Dr Jean Carlet was named Project manager for the French government National Task Force for the Preservation of Antibiotics created by Health Minister Marisol Touraine.

### Infection control

WAAAR is very active in the domain of infection control and participates in global efforts in this domain.

Professor Didier Pittet, known for his worldwide work on hand hygiene with the patient section at WHO

initiated the bi-yearly World Conference on Infection Control in Geneva, ICPIIC to which we participate.

Dr Pittet was a key scientific collaborator to the Benin conference and has been keen to support IPC /patient safety efforts including those for the French speakers from Africa who have benefited from a special programme in ICPIIC (2).

### Patient safety

Patient Safety undertakings were also key to WAAAR's work with the association *Le Lien* (founding Member) (3). The NGO *Le Lien* organizes regular events to highlight errors in health care and the way to counter them.

As well, WAAAR co-founding member, Garance Upham, was on the Steering Committee of Patients for Patient Safety of the World Alliance for Patient Safety for ten years, later renamed WHO Patient Safety Programme (2004–2014).

### Communications

Media/Research seminar with the Sorbonne University of Paris to examine various aspects of public communication on AMR for the population, by WAAAR Member Professor Antoine Andreumont, Hôpital Bichat, Paris and member AGISAR/WHO.

### Interventions in scientific and political conferences

Dr Carlet and other prominent members of WAAAR have presented scientific papers in conferences around the world including Isqua, JNI, MSF, ESICM, Creirif, Santé et Biodiversité, *Le Lien*, World Health Assembly, Journées de Pathologies exotiques, ISF, Pathologies émergentes, Madrid MoH, and Davos 2015.

WAAAR is a partner of the World Sepsis Day, a collaborator of COMBACTE (4,5).

### Work with the United Nations

Putting antibiotics on the UNESCO list is one of its founding members' objectives.

At the May 2012 World Health Assembly, with the French Ambassador to the UN, and the support of the MoH, the memory of WHO Water and Sanitation Engineer, Yves Chartier, who died in a mountain accident was honoured. Chartier had done outstanding work in infection control and French public health, (Protocol on Natural Ventilation, injection safety, collaboration with USAID on water, guidelines on sanitation). The event and the Journal highlighted the urgency of AMR control with Dr Jean Carlet.

Chairing the 2012 World Healthcare-Associated Infections Forum at the Biomérieux Foundation and follow-up events. Ready for a world without antibiotics? The Pensières Antibiotic Resistance Call to Action (4) and again in 2014.

Participation in Oslo's Diplomacy and Health (Brazil, France, Indonesia, Norway, Senegal and Thailand) meeting in November 2014 sponsored by the Norwegian Institute of Public Health. Outcome document from Oslo meeting "Commitments to Responsible Use of Antimicrobials in Humans" (5).

Participation in COMBACTE, in World Sepsis Day to create guidelines, to support and actions for the Chennai Declaration and European Antibiotic Awareness Day (6,7).

### Publications

Dr Jean Carlet has published in scientific journals for more than 20 years, specializing in acute care, on Sepsis, ARDS, issues in infection control and antibiotic resistance. Just in the past few months, Dr Carlet has published in *ICHE (Infection Control Hospital Epidemiology)*, *AJRCCM*, *Indian Journal of Critical Care*, *CID*, *Intensive Care Medicine*, *Réanimation*, *Lettre infectiologue*, *ISID*, as well as in the public press (*Le Monde*, *Huffington Post*) and he has attended many congresses.

### References

1. La Conférence Internationale des Ministres de la Santé sur la prévention et le contrôle de l'infection en milieu de soins en Afrique (CIMSEF), in the news bulletin of WHO-OIMS AFRO (in French): <http://www.afro.who.int/fr/benin/press-materials/item/5252-la-cimsef-s%E2%80%99est-achev%C3%A9-%C3%A0-cotonou.html>
2. ICPIIC's web site : <http://www.icpic.com>
3. *Le Lien* : <http://lelien-association.fr/asso/index.php>.
4. 2012 <http://www.ncbi.nlm.nih.gov/pubmed/22958833>, and again subsequently: <http://www.biomerieux.com/fr/4eme-forum-mondial-sur-la-resistance-bacterienne>
5. Norwegian Institute of Public Health Meeting: "Commitments to the responsible use of antimicrobials" [http://www.fhi.no/eway/default.aspx?pid=240&trg=MainContent\\_6898&Main\\_6664=6898:0:25,8195:1:0:0:0:0&MainContent\\_6898=6706:0:25,9026:1:0:0:0:0 and outcome document: http://www.fhi.no/dokumenter/739155c19b.pdf](http://www.fhi.no/eway/default.aspx?pid=240&trg=MainContent_6898&Main_6664=6898:0:25,8195:1:0:0:0:0&MainContent_6898=6706:0:25,9026:1:0:0:0:0 and outcome document: http://www.fhi.no/dokumenter/739155c19b.pdf)
6. <http://www.combacte.com>
7. [www.world-sepsis-day.org](http://www.world-sepsis-day.org)

## Appendix 1: The WAAAR declaration against antibiotic resistance: The Paris Declaration: June 2014

The increase in antibiotic resistant bacteria poses a major healthcare threat. In the face of an almost complete absence of new antimicrobial drugs in development, antibiotic resistance (ABR) has become one of the main public health problems of our time. Antibiotics are a unique class of medications because of their potential societal impact; use of an antibiotic in a single patient can select for ABR that can spread to other people, animals, and the environment, making an antibacterial used in one patient ineffective for many others. Bacterial resistance can evolve rapidly. As bacteria acquire resistance mechanisms, the altered bacterial genetic material coding for resistance mechanisms can be transmitted at times readily between bacteria, broadening the reach and extent of resistance. Treatment failures because of multidrug resistant (MDR) bacteria, once rare, notable, and limited to hospitals, now occur very commonly in hospitals and increasingly in the community as well. It is estimated that at a minimum 25,000 patients in Europe and 23,000 in the USA die each year from infections caused by resistant bacteria. The cost of antibiotic resistance is tremendous, whether measured as the personal and societal burden of illness, death rates, or healthcare costs.

Although it is a never-ended phenomenon, antibiotic resistance is directly related to the volume of antibiotics used. We are using increasing amounts of antibiotics in health care and agriculture, and discharging these active drugs into the environment. The impact of widespread antibiotic use is enormous, promoting the development and dissemination of antimicrobial resistance.

Safeguarding antibiotics will require a concerted effort by citizens, patients and prescribers. The primary goal of WAAAR is to raise awareness about the urgency and magnitude of the threat and to promote an international dialogue to assist in effective responses. The Alliance, in particular through this declaration, is dedicated to actively promoting antibiotic preservation and to raising awareness among antibiotic prescribers, politicians and policy-makers, patient safety and advocacy groups, the pharmaceutical industry, international health organizations, and the general population. Individual actions, no matter how well intended, are doomed to failure unless there is an international dialogue, a common sense of purpose, and broad consensus on how best to proceed.

We must change how antibiotics are used and adopt proactive strategies, similar to those used to save

endangered species. Preservation of the efficacy of antibiotics and to stabilization of antibiotic-susceptible bacterial ecosystems should be global goals.

We urge all of you to participate in this crusade, in your own field of interest. The medical miracle of antibiotic therapy must be protected – this is a global priority and our duty. Please, help us to act NOW, by supporting this declaration, to promote wiser use of antibiotics in animal and human health, and the necessary accompanying political actions to support better education, integrated surveillance for public health action, and research.

### WAAAR advocates for the following 10 actions:

- 1. Promotion of awareness of all the stakeholders - including the general public - of the threat represented by antibiotic resistance
  - Strong cooperation among international political, economic and public health organizations, which, all together, must take the lead of this action against antibiotic resistance.
- 2. Organization, in each country, ideally by Ministries of Health or regulatory bodies, of a financed national plan for the containment of antibiotic resistance, with the participation of all stakeholders, including patient advocacy groups
- 3. Continuous access to antibiotics of assured quality, especially in middle and low income countries
- 4. Integrated Surveillance of antibiotic resistance (ABR) and antibiotic use Standardized monitoring of antibiotic use and resistance at institution, regional, and country (comprehensive national data instead) level (through a Centers for Diseases Control and Prevention model) to allow comparative statistics (benchmarking), to be updated preferably in real-time and at least every 12 months. This will require adequate laboratory capacity using international standardized methods that may be facilitated by a centralized technologic coordinating infrastructure and information technology
- 5. Use of diagnostic tests
  - Appropriate use of existing diagnostic tests and development and implementation of new rapid, cost-effective and accurate diagnostic tests, adapted to the local context, to aid in distinguishing bacterial and nonbacterial etiologies. Rapid diagnostics may help clinicians avoid unnecessary treatments, rapidly select appropriate targeted therapies and inform the duration of treatment
- 6. Antibiotic stewardship (prudent, controlled and monitored approaches to the use of antibiotics)

- In humans (hospitals, long term care facilities and primary care).
- In animals (animal husbandry, agriculture, aquaculture and animal health /veterinary setting), in a “one health” philosophy.
- Progressive elimination of the “over the counter” (i.e. available without a prescription) access to antibiotics (systemic and topicals) for humans or animals.
- Ban of the use of antibiotics as growth promotion in food animals, and exceptional use in prophylaxis.
- Rational use of metaphylaxis (Prophylaxis when some animals in the livestock are sick, or at high risk to be sick), and of animal treatment.
- Limitation of the use of critically important antibiotics in humans and animals (e.g., carbapenems)
- 7. Educational efforts for change
  - Educational programs directed at children/teenagers on antibiotics, bacterial resistance, and infection control (e-Bug model)
  - Development of large coordinated, effective information and awareness campaigns directed at the public on expectations about the rational/appropriate use of antibiotics.
  - Continuous education and training programs in the curriculum for all health care professionals in all settings (veterinarians, medical, dental, nursing, pharmacy and allied health care schools) and continuing professional education programs, on the rational use of antibiotics, including indications, dosing and duration of therapy. Education of farmers
- 8. Containment of bacterial transmission and prevention of infection
  - Promotion of universal hand hygiene and all infection control interventions that have been proven to reduce rates of resistance
  - Relentless efforts to prevent transmission of MDR organisms in healthcare, food production and animal husbandry
  - Programs to limit the contamination of drinking water with MDR bacteria, as well as contamination of the environment
  - Promotion of the use of available vaccines, in humans and animals
- 9. Basic and applied research, and development of new antibiotics
  - Increased support for basic and applied research aiming at curbing bacterial resistance in human and veterinary medicine.
  - Use of the principles of orphan drugs for new antibiotics
- Incentives to stimulate research of new drugs (antibiotics and novel compounds) and vaccines via regulatory pathways that allow for fast track development.
- New economic business models to support the cost of innovation while safeguarding public health interests.
- 10. Request for UNESCO to include the “concept of antibiotic” in the list of the intangible cultural heritage.

WAAAR is a group of 700 individuals from 55 different countries representing all the key stakeholders (physicians, veterinarians, microbiologists, surgeons, pharmacists, nurses, evolutionary biologists, ecologists, environmentalists, patient advocacy groups). The Alliance receives support from more than 140 learned societies or professional groups throughout the world. WAAAR is a nonprofit organization open to professionals and consumers worldwide. WAAAR receives no funding from the pharmaceutical industry

### Supporting Individuals

Laurent Aaron (France), Mohamed Salah Abassi (Tunisia), Lilian Abbo (USA), Oladipo Aboderin (Nigeria), Edward Abraham (USA), Fekri Abroug (Tunisia), Jacques Acar (France), Wafa Achour (Tunisia), Javier Adachi (USA), Seif Al-Abri (Oman), Haifaa Al-Mousa (Kuwait), Antonio Albaya-Moreno (Spain), Corinne Alberti (France), Serge Alfandari (France), Amani Alnimr (Saudi Arabia), Celia Alpuche Aranda (Mexico), Francisco Alvarez de Lerma (Spain), Fatma Amer (Egypt), Antoine Andremont (France), François Angoulvant (France), Maryvonne Anguill (France), Massimo Antonelli (Italy), Eleni Antoniadou (Greece), Guillaume Arlet (France), Apostolos Armaganidis (Greece), Anne Arnera (France), Antonio Artigas (Spain), Claude Attali (France), Frédéric Auber (France), Jean-Pierre Aubert (France), Bernard Augereau (France), Martine Aupée (France), Olfa Bahri (Tunisia), Françoise Ballereau (France), Gérard Bapt (France), Fernando Baquero (Spain), Timothy Barkhan (Singapore), Ouahid Barouti (Morocco), Marie-Anne Barthelemy (France), Greg Barton (UK), Davide Bastoni (Italy), Michel Baussier (France), Luis Bavestrello (Chile), Birgit Beger (Belgium), Samuel Benenson (Israel), Fethi Bensalem (France), Guillaume Béraud (France), Frederique Bergheau (France), Gordon Bernard (USA), Philippe Berthelot (France), Xavier Bertrand (France), Frédérique Beuhorry-Sassus (France), Pascal Beuret (France), John Billington (USA), Jacques Birgé (France), Sandra Biscardi (France), Luis Blanch (Spain), Hervé Blanchard (France), Thomas Bleck (USA), Joseph Blondeau (Canada), François Blot (France), France Borgey (France), Alain Bousquet-Mélou (France), Jean Brami

(France), Christophe Brard (France), Stéphane Bretagne (France), Cédric Bretonnière (France), Adrian Brink (South Africa), Sheldon Brown (USA), Catherine Bruant-Rodier (France), Christian Brun-Buisson (France), Fabrice Bruneel (France), Frederico Bruzzi de Carvalho (Brazil), Christophe Buhot (France), Huda Bukharie (Saudi Arabia), André Cabié (France), Thierry Calandra (Switzerland), Isabelle Caniaux (France), Manuela Caniça (Portugal), Rafael Canton (Spain), Philippe Carencio (France), Camille Carlet (France), Claude Carlet (France), Florian Carlet (France), Jean Carlet (France), Romain Carlet (France), Otto Cars (Sweden), Manuel Cassiano-Neves (Portugal), Bernard Castan (France), Vincent Castellan (France), France Cazenave-Roblot (France), Alain-Michel Ceretti (France), Jean-Charles Chakarian (France), Ludivine Chalumeau-Lemoine (France), John Chandy (USA), Bernard Chanfreau (France), Jean Chastre (France), Robert Chausset (France), Pascal Chavanet (France), William Cheadle (USA), Jean-Daniel Chiche (France), Christian Chidiac (France), Olivier Chosidow (France), Natalia Chueca (Spain), Jon Cohen (UK), Robert Cohen (France), Peter Collignon (Australia), Frédéric Collot (France), Patrick Coloby (France), John Conly (Canada), Cruz Cordero (Brazil), Catherine Cordonnier (France), Alejandra Corso (Argentina), Sara Cosgrove (USA), René Courcol (France), Steve Crane (USA), Donald Craven (USA), Adnida Crespín (France), Marces Cyrillo (Brazil), Pierre-Eric Danin (France), Jan De Waele (Belgium), Pierre Dellamonica (France), E. Patchen Dellinger (USA), Philip Dellinger (USA), Jean Delmont (France), Eric Denes (France), George Dimopoulos (Greece), Dimitri Drekonja (USA), Anahi Dreser Mansilla (Mexico), Pierre-Louis Druais (France), Sylvie Dufour-Pierrat (France), Catherine Dumartin (France), Martin Dünser (Austria), Michel Dupont (France), Ricardo Durlach (Argentina), Oliver Dyar (UK), Gabriela Echaniz (Mexico), Paul Edelstein (USA), Philippe Eggimann (Switzerland), Mohamed Elghonemi (Egypt), Naima Elmdaghri (Morocco), Rehab Elsaid (Egypt), Rehab Elsokari (Egypt), Dan Engelhard (Israel), Jacques Fabry (France), Christopher Farmer (USA), J. Fernandez (Spain), Simon Finfer (Australia), Patricia Finn (USA), Katrin Fjeldsted (Israel), Daniel Floret (France), Francesco Flozaro (Spain), Jacinthe Foegle (France), Xavier Forceville (France), Sandra Fournier (France), Irène Frachon (France), Alexander Friedrich (The Netherlands), Pascal Funuel (France), Didier Gaillard (France), Jacques Gaillat (France), Tatiana Galperine (France), Karine Gambarotto (France), Bernard Garo (France), Maité Garrouste-Orgeas (France), Petra Gastemeier (Germany), Jean-Yves Gauchot (France), Remy Gauzit (France), Gaëtan Gavazzi (France), Louise Gazagne (France), Julie Gerberding (USA), Abdul Ghafur (India), Evangelos Giamarellos-Bourboulis (Greece), Eleni Giamarellou (Greece), Marine Giard (France), Mark Gilchrist (UK), Jacques Gilquin (France), Fernando Gilsanz (Spain), Marek Gniadkowski (Poland), Charalambos Gogos (Greece), Don Goldman (USA), Florence Gordon (France), Thomas Gottlieb (Australia), Ian Gould (UK), Joao Gouveia (Portugal), Jennifer Grant (Canada), Lindsay Grason (Australia), Alix Greder (France), Hajo Grundman (The Netherlands), Eric Guaguere (France), Gwenaëlle Guérout-Locher (France), Benoit Guery (France), Bertrand Guidet (France), Catherine Guignabert (France), Pradip Gupta (India), Sanjay Gupta (UK), Mohan Gurjar (India), Manuel Guzman (Venezuela), Joseph Hajjar (France), Noha Hammad (Egypt), Anette Hammerum (Denmark), Hakan Hanberger (Sweden), Regina Hanke (Germany), Stephan Harbarth (Switzerland), Anita Harel (France), Elisabeth Heisbourg (Austria), Isabelle Hermes (France), Jean-Pierre Hermet (France), Bernard Hirschel (Switzerland), Bruno Hoen (France), Aidan Hollis (Canada), Xiao Honghong (China), David Hooper (USA), Juan Pablo Horcajada (Spain), Bruno Housset (France), Waleria Hryniewicz (Poland), Li Yang Hsu (Singapore), Susan Huang (USA), James Hughes (USA), Jean-Louis Hunault (France), Lotte Jakobsen (Denmark), Nordiah Jalil (Malaysia), Hilde Jansens (Belgium), Vincent Jarlier (France), William Jarvis (USA), Dominique Jean (France), Matjaz Jereb (Slovenia), James Johnson (USA), Marie-Laure Joly-Guillou (France), Olivier Jonquet (France), Guillaume Kac (France), Deogracias Kaddu-Mulindwa (Uganda), Mitsuo Kaku (Japan), Badreddine Kilani (Tunisia), Eui-Chong Kim (South Korea), Dorothee Kinde Gazard (Benin), Keith Klugman (USA), Stacey Klutts (USA), Jan Kluytmans (The Netherlands), Marin Kollef (USA), Despoina Koulenti (Greece), Michael Kresken (Germany), François Lacoïn (France), Jean-Patrick Lajonchère (France), Nathalie Landgraf (France), Gérard Larroussinie (France), Pierre-François Laterre (Belgium), Anne-Marie Lavenaire (France), Thierry Lavigne (France), Ramanan Laxminarayan (USA), Thi Anh Thu Le (Vietnam), Françoise Leblanc-Jouffre (France), Nam Yong Lee (South Korea), Olivier Lehiani (France), Hervé Lelouet (France), Frédérique Lemanach-Kergueris (France), Alain Lepape (France), Joel Leroy (France), Xavier Lescure (France), Mitchell Levy (USA), Gabriel Levy-Hara (Argentina), Ling Moi Lin (Singapore), Jeffrey Lipman (Australia), Joel Livartowski (France), David Looke (Australia), Fernando Luis Lopez Cardozo (Brazil), Francisco Lopez Medrano (Spain), Anne Lotthé (France), Jean Christophe Lucet (France), David Lupande (D. R. Congo), Jean-Yves Madec (France), Jean-Luc Mainardi (France), Sundaesan Maiyagan (Mauritius), Jordi Mancebo (Spain), Franck Mansour-Adeoti (France), Enrique Maravi (Spain),

Bruno Marchou (France), Darcy Marciniuk (Canada), John Marshall (Canada), Claude Martin (France), David Martin (USA), Luis Martinez-Martinez (Spain), Alain Martinot (France), Emilio Maseda (Spain), Dimitrios Matamis (Greece), Sophie Matheron (France), Ricardo Matos (Portugal), Marie Matthews (UK), Thierry May (France), Thierry Mayet (France), John McGowan (USA), Shaheen Mehtar (South Africa), Jose Mario Meira Teles (Brazil), Marc Mendelson (South Africa), Christian Michelet (France), Albert Mifsud (UK), Magolia Mikaszewska-Sokolewicz (Poland), Jessica Minion (Canada), Christelle Miquel (France), Jean-Paul Mira (France), Jose Miro (Spain), Benoit Misset (France), Jean-Jacques Monot (France), Philippe Montravers (France), Joy Mootien (France), Rui Moreno (Portugal), Andrew Morris (USA), Gérard Moulin (France), Cécile Mourlan (France), Gilbert Mouthon (France), Wafaa Mowafy (Egypt), Elke Muhl (Germany), A. Muruganathan (India), Enani Mushira (Saudi Arabia), Babacar N'Doye (Senegal), Aburjania Nana (USA), Michael Niederman (USA), Gérard Nitenberg (France), Patrice Nordman (France), Assumpta Novira (Spain), Cyrille Nowak (France), Iruka Okeke (USA), Pedro Maria Olaechea (Spain), Abeer Omar (Kuwait), Steve Opal (USA), Carlos Ortiz Leyba (Spain), Bauke Oudega (The Netherlands), Eric Oziol (France), Bernard Page (France), Jose Arthur Paiva (Portugal), Lucy Palmer (USA), Mercedes Palomar-Martinez (Spain), Pierre Parneix (France), Didier Payen de la Garanderie (France), Eli Perencevich (USA), Trish Perl (USA), Christian Perronne (France), Georg Peters (Germany), Matthew Peters (Australia), Dominique Peyramond (France), François Philippart (France), Didier Pittet (Switzerland), Jean-François Pittet (USA), Patrick Plésiat (France), Mathias Pletz (Germany), Marie-Cécile Ploy (France), Florence Pospisil (France), Pascal Pouedras (France), Garyphallia Poulakou (Greece), Anny Poursinoff (France), Peter Pronovost (USA), Céline Pulcini (France), Massimo Puoti (Italy), Shanmugan Puvanendiram (Sri Lanka), Michael Quintel (Germany), Christian Rabaud (France), Claude Rambaud (France), Helena Ramos (Portugal), Ossama Rassla (Egypt), Josette Raymond (France), Bernard Regnier (France), Konrad Reinhart (Germany), Jordi Rello Condomines (Spain), Jean-Claude Revil (Reveil?), (France), Agnès Riché (France), Paul Richman (USA), Rosana Richmann (Brasil), Viviana Rodriguez (Argentina), Jesus Rodriguez-Bano (Spain), Olivier Romain (France), Karine Romand (France), Elisabeth Rossines (France), Monlque Rothan-Tondeur (France), Jean-François Rousselot (France), Ethan Rubinstein (Canada), Vladimir Rudnov (Russia), Narender Saini (India), Dominique Salmon (France), Reinaldo Salomao (Brazil), Miguel Sanchez Garcia (Spain), Antonio Santos-Bouza (Spain), Marie-Caude Saux

(France), Anne Savey (France), Lynora Saxinger (Canada), Benoit Schlemmer (France), Jean-Luc Schmit (France), Dietmar Schneider (Germany), Janet Schoemaker (USA), Sanjeev Singh (India), Jordi Sole-Violan (Spain), Sara Soto (France), Jean-Paul Stahl (France), Annabelle Stoclin (France), Alexis Tabah (Australia), Jean-Philippe Tabut (France), Paul Anamtharajah Tambyah (Singapore), Fabienne Tamion (France), Phillip Tarr (USA), Pierre Tattevin (France), Fred Tenover (USA), Nicolas Terzi (France), Marthe Than Lecompte (Switzerland), Jonathan Theodore (France), Didier Thevenin (France), Philippe Thevenot (France), Laurent Thiriet (France), Carol Thompson (USA), Joseph Thurn (USA), Glenn Tillotson (USA), Hanene Tiouiri (Tunisia), Antonio Torres (Spain), François Trémolières (France), Michel Troadec (France), Rabiatu Umar (Nigeria), Garance Upham (France), Carl Urban (USA), Jan Vaarten (-), Dominique Valla (France), Nathalie Van Der Mee-Marquet (France), Jos Van der Meer (The Netherlands), Tom Van Der Poll (The Netherlands), Jacques Vancel (France), Philippe Vanhems (France), Remi Varin (France), Emmanuelle Varon (France), David Vaughan (USA), Marc Veilly (France), K. Vijayakumar (India), Alvaro Villanueva (Columbia), Jean-Louis Vincent (Belgium), Virginie Vitrat (France), Andreas Voss (The Netherlands), Robert Wachter (USA), Tim Walsh (UK), Peter Wark (Australia), Grant Waterer (Australia), Henrik Caspar Wegener (Denmark), Pierre Weinbreck (France), Robert Weinstein (USA), Scott Weissman (USA), Jeanine Wiener-Kronish (USA), Alexander Wilmer (Belgium), Benjamin Wyplosz (France), Ibrahim Yacoub-Agha (France), Melanie Young (USA), Ibrahim Yusuf (Nigeria), Emile Zein (Lebanon), George Zhanel (Canada), Stephen Zinner (USA), Joséphine Zoungrana (Burkina Faso), Nadezhda Zubareva (Russia).

### Supporting national and international agencies

Centers for Disease Control and prevention (CDC)

### Supporting Medical Organisations

American College of Chest Physicians (ACCP) (Darcy Marciniuk), American Society of Microbiology (ASM) (Janet Schoemaker), American Thoracic Society (ATS) (Patricia Finn, Steve Crane), Analgesia and Intensive Care Medicine (SIAARTI) (Massimo Antonelli), Andalusian Infectious Diseases Society (Jesus Gomes Mateos), Asia Pacific Society of Infection Control (APSIC) (Ling Moi Lin), Associação de Medicina Intensiva Brasileira (AMIB) (Jose Mario Meira Teles), Association Française d'Urologie (AFU) (Patrick Coloby), Association Française de Chirurgie (Jean Pierre Arnaud), Association Française des Vétérinaires pour Animaux de Compagnie (AFVAC) (Eric Guaguère, Jean-

François Rousselot), Association of Physicians of India (Dr Muruganathan), Association Tunisienne de Réanimation (ATR) (Fekri Abroug), Association Vétérinaire Equine Française (AVEF) (Jean-Yves Gauchot), Australasian Society for Infectious Diseases (ASID) (David Looke), Australian Society for Antimicrobials (ASA) (Thomas Gottlieb), Belgian Society of Intensive Care Medicine (SIZ) (Alexander Wilmer), Belgium Infection Control Society (BICS) (Hilde Jansens), Brazilian Society of Infectiology, British Infection Association (Albert Mifsud), British Society of Antimicrobial Chemotherapy (Nicholas Brown, Laura Piddock), Centre National de Référence de la Résistance aux Antibiotiques (Patrick Plésiat), Sociedad Española de Medicina Intensiva, Crítica y Unidades Coronarias (SEMICYUC) (Luis Blanch, Miguel Sanchez Garcia, Francisco Alvarez Lerma), Egyptian Society for Infection Control (ESIC) (Ossama Rasslan), European Federation of National Associations of Orthopaedics and Traumatology (Manuel Cassiano-Neves), European Society of Infectious Diseases and Clinical Microbiology (ESCMID) (Gunnar Kahlmeter, Murat Akova), European Society of Intensive Care Medicine (ESICM) (Jean Daniel Chiche), Fédération Française de Pneumologie (Bruno Housset), Federation of European Microbiological Societies (FEMS) (Bauke Oudega), Federation of Infectious Diseases Societies of Southern Africa (Marc Mendelson), Federation Vétérinaire Européenne (FVE) (Christophe Buhot, Jan Vaarten), German Interdisciplinary Association of Intensive and Emergency Medicine (Dietmar Schneider, Michael Quintel, Elke Muhl), Hellenic Society of Antimicrobial Chemotherapy (Helen Giamarellou), Hellenic Society of Intensive Care (Antonios Mavrommatis), Ho Chi Minh City Infection Control Society (Thi Anh Thu Le), Indian Medical Association (Narendra Saini, K. Vijayakumar), Infection Control Association of Singapore (ICAS) (Ling Moi Lin), Instituto Latino-Americano de Sepsis (ILAS) (Reinaldo Salomao), International Society of Chemotherapy (Ian Gould), International Society of Infectious Diseases (ISID) (Jon Cohen, Keith Klugman), Israel Society for Infectious Diseases, Italian Society of Anesthesiology, Korean Society of Clinical Microbiology (Nam Yong Lee), Lebanese Association for Medical Diagnosis and Auto-Immune Diseases (Lambda) (Georges Khalil), Pan American Society of Infectious Diseases (Luis Bavestrello), Paul-Ehrlich-Gesellschaft für Chemotherapie e.V. (Paul-Ehrlich-Society for Chemotherapy) (Achim Hoerauf), Polish Society of Anesthesiology and Intensive Care (Magolia Mikaszewska-Sokolewicz), Portuguese Society of Infectious Diseases and Clinical Microbiology (Helena Ramos), Portuguese Society of Intensive Care (Joao Gouveia, Ricardo Matos), Saudi Society of Medical Microbiology and Infectious Diseases (Huda Bukharie), Sociedad Española de Enfermedades Infecciosas y Microbiología Clínica (SEIMC) (Jose M Miro), Sociedad Española de Enfermedades Respiratorias (SEPAR) (Pilar de Lucas), Sociedad Española de Medicina Intensiva, Crítica y Unidades Coronarias (SEMICYUC) (Luis Blanch, Miguel Sanchez Garcia, Francisco Alvarez Lerma, Pedro Maria Olaechea), Society for Healthcare Epidemiology of America (SHEA) (Melanie Young), Sociedade Paulista de Infectologia-Brazil (Rosana Richman), Société Belge de Microbiologie Clinique (BVIKM/SBIMC) (Camelia Rossi), Société de Pathologie Exotique (Jean Delmont), Société de Pathologie Infectieuse de Langue Française (SPILF) (Christian Rabaud), Société de Pneumologie de Langue Française (SPLF) (Alain Didier), Société de Réanimation de Langue Française (SRLF) (Djillali Annane), Société Française d'Anesthésie Réanimation (SFAR) (Claude Ecoffey), Société Française d'Hygiène Hospitalière (SF2H) (Philippe Berthelot), Société Française de Chirurgie Orthopédique et Traumatologique (Bernard Augereau), Société Française de Dermatologie (SFD) (Olivier Chosidow), Société Française de Gériatrie et Gérontologie (SFGG) (Geneviève Ruault), Société Française de Greffe de Moelle et de Thérapie Cellulaire (SFGM-TC) (Ibrahim Yacoub), Société Française de Médecine Générale (SFMG) (Pascale Arnould), Société Française de Médecine Interne (SFMI) (Loic Guillevin), Société Française de Microbiologie (SFM) (René Courcol), Société Française de Pharmacie Clinique (SFPC) (Marie-Claude Saux, Remi Varin), Société Française de Santé Publique (SFSP) (Pierre Lombraill), Société Libanaise de Médecine Interne (SLMI) (Emile Zein), Société Marocaine d'Hygiène Hospitalière (Ouahid Barouti), Société Marocaine de Maladies Infectieuses (SMMI), Société Nationale des Groupements Techniques Vétérinaires (SNGTV) (Christophe Brard), Société Tunisienne de Pathologie Infectieuse (STPI), Society of Critical Care Medicine (SCCM) (Chris Farmer, David Martin), Society of Infectious Diseases of Singapore (Paul Anantharaja Tambyah), Société Suisse d'Infectiologie (Bernard Hirschel), Spanish Society of Anesthesiology and Critical Care (Fernando Gilsanz, Emilio Maseda), Spanish Society of Infectious Diseases and Clinical Microbiology (José Miro, Rafael Canton), Standing Committee of European Doctors (Katrin Fjeldsted, Birgit Beger), Surgical Infection Society (SIS) (William Cheadle), The Infectious Diseases Society of America (IDSA) (John Billington, David Relman), The Mexican Society of Infectious Diseases and Clinical Microbiology (AMIMC) (Celia Alpuche Aranada), Thoracic Society of Australia and New Zealand (Matthew Peters, Peter Wark), United Kingdom Clinical Pharmacy

Association (UKCPA) (Mark Borthwick), World Federation of Societies of Intensive Care and Critical Care Medicine (WFSICCM) (Jean-Louis Vincent).

### Other Supporting Groups

Antibiolor (C. Rabaud), Antimicrobial Stewardship Working Group of the International Society of Chemotherapy (ISC) (Gabriel Levy Hara), Arab Alliance for a Prudent Use of Antimicrobials (Ar-Apua) (Fatma Amer), Association de Lutte contre les Infections Associées aux Soins (ALIAS), Association des Médecins Coordonnateurs en EHPAD, Association des Victimes d'Infection Nosocomiale (ADVIN), Association Le CISS (Claude Rambaud), Association Le LIEN (Madeleine Madoré), Association Phagespoir (Jérôme Larché), Association pour la Chimiothérapie Anti-infectieuse (ACAI), Association pour la Recherche en Microbiologie Expérimentale (Marie-Laure Joly-Guillou), Austrian Antibiotic Stewardship Group (Elisabeth Heisbourg), CCLIN Ouest (Martine Aupée), Center for Infection Control and the APIC-Saudi chapter (Hanan Balkhy), Chaire Recherche Infirmière, AP-HP EHESP (France, Monique Rothan-Tondeur), Collège des Enseignants de Maladies Infectieuses (CMIT) (Christian Michelet), Collège National de Médecine Générale (CNMG), Collège National des Généralistes Enseignants (CNGE) (Pierre Louis Druais), Comité de Pilotage des Réseaux de Surveillance ATB et BMR Sud Est, Doctors Without Borders/Médecins Sans Frontières (Arlène Chua, Richard Murphy), Egyptian Patient Safety Association (EPSA) (Ossama Rassla), ESGAP working group (ESCMID) (Jordi Rello), Fédération des Spécialités Médicales (FSM), Fédération Française d'Infectiologie (FFI) (Christian Perrone), Fédération Française de Pneumologie (FFP) (Bruno Housset), Global Sepsis Alliance (Konrad Reinhart), Groupe de Pathologie Infectieuse en Pédiatrie (GPIP) (Robert Cohen), Grupo de Infecção e Sepsis (Joao Jaime Sa), Grupo de Trabajo de Enfermedades Infecciosas y Sepsis De la Sociedad Española de Medicina Intensiva, Hellenic Sepsis Study Group (Gogos Charalambos, Evangelos Giamarelos-Bourboulis), Infection Control Directorate (Ministry of Health-Kuwait), Infection Prevention and Control African Network (IPCAN) (Shaheen Mehtar), Institut de Recherche en Médecine Générale (IRMG), Institut Maurice Rapin (IMR) (Christian Brun-Buisson), International Forum for Acute Care Trialists (InFACT) (John Marshall), International Sepsis Forum (Tom Van Der Poll), Le Forum des Bio-hygiénistes, Ligue Africaine des Associations pour la Sécurité des Patients (LIASEP), Medqual (F. Ballereau), National Committee for the Proper Use of Antimicrobials (Ministry of Health-Kuwait), Observatoire du

Risque Infectieux en Gériatrie (ORIG) (Monique Rothan-Tondeur), Observatoire National d'Epidémiologie de la Resistance Bactérienne aux antibiotiques (ONERBA) (Marie-Hélène Nicolas-Chanoine), Portuguese Intersectorial Alliance for the Preservation of the Antibiotics (APAPA) (Jose Arthur Paiva), Programme National de Lutte contre l'Infection Nosocomiale (PRONALIN), Sénégal (Babacar N'Doye), Réseau International pour la Planification et l'Amélioration de la Qualité des Soins en Afrique (RIPAQS) (Bernard Chanfreau), Réseau Sud-Est de Surveillance et de Prévention des Bactéries Multirésistantes aux Antibiotiques, South African Antibiotic Stewardship programme (Adrian Brink), Spanish Network for Research in Infectious Diseases (REIPI) (Jesus Rodriguez-Bano), Safe Observer International (SOI) (Garance Upham), The Bekele Afessa Initiative to Improve Sepsis Care in Resource-Limited Areas (Joseph Christopher Farmer), The Canadian Antimicrobial Resistance Alliance (CARA), The Eastern Mediterranean Regional Network for Infection Control (EMRNI) (Ossama Rassla), The Gulf Cooperation council (GCC) (Hanan Balkhy).

### Appendix 2: "Commitments to Responsible Use of Antimicrobials in Humans" 13-14 November, 2014 Oslo, Norway

We, the participants<sup>i</sup> of the Oslo meeting<sup>ii</sup> on responsible use of antimicrobials in humans, gathered in Oslo, Norway on the 13–14 of November, 2014 to discuss the urgent need to improve human use of antimicrobials, and to identify clear strategies and actions to increase their appropriate responsible use while assuring their access. We recognize that prompt coordinated and collective action is essential because of the rapidly growing global spread of antimicrobial resistance.

We acknowledge antimicrobial resistance to be a severe threat to global health that could undermine decades of progress in combating infectious diseases and preventing surgical and other health care related infections, and that misuse and overuse of antimicrobials are key drivers. At the same time, we recognize that where use is warranted, the lack of antimicrobial treatment, or inadequate treatment, either through lack of access or inappropriate use, remains an important contributor to death and illness. We applaud the efforts by WHO to place antimicrobial resistance on the

<sup>i</sup>Countries and organizations participating in the Oslo meeting on responsible use of antimicrobials in humans, 13-14 November can be found on the webpage of the Norwegian Institute of Public Health.

<sup>ii</sup>The meeting on responsible use of antimicrobials in humans is hosted by Brazil, France, Indonesia, Norway, Senegal, South Africa and Thailand, organized together with the WHO.



global agenda to assure continued effectiveness of and access to effective antimicrobials for future generations. In reference to the consultation in The Hague, Netherlands on 25-26 June 2014, we agree that antimicrobial resistance needs a “One Health” approach<sup>iii</sup> engaging all stakeholders from the human and animal health, agriculture, aquatic and environmental sectors, both governmental and civil society. We see the ongoing collaboration between the WHO, OIE and FAO as a cornerstone in this work.

We recognize the need to strengthen health systems, noting the importance of interventions to assure infection prevention and control. This should be done through behavioral change, appropriate and timely treatment, immunization coverage and development of new vaccines, access to safe water, hygiene, sanitation, and waste management. Models for supporting research and development into new and novel antimicrobials need to be aligned with global needs. These models should actively explore alternative mechanisms for incentivizing research and development, including delinking research and development costs from product prices, and decoupling reimbursement to manufacturers from the volume of consumption. These models need to include mechanisms to reserve the use and maintain the effectiveness of these new antimicrobials.

This consultation has focused on concrete strategies to shift words into action. We acknowledge the challenges of developing a global action plan which aims to guide efforts to combat antimicrobial resistance in all countries, taking into account the many differences in health systems, culture, ecology, epidemiology and economic status. However, we consider international collective effort, including political commitment at the national level, to be essential for the success of the proposed Global Action Plan in combating antimicrobial resistance. The final Global Action Plan should send a clear and strong message that addressing antimicrobial resistance and responsible use of antimicrobials is a priority for all countries and stakeholders, and the plan should give guidance on how to implement mitigating actions. Political will coupled with concrete steps are the keys to meaningful impact.

### Meeting recommendations:

We believe that all stakeholders, including policymakers and regulators, providers and health professionals, patients and

the public, producers and distributors, and payers, from the public and private sectors and civil society alike, have a shared responsibility to tackle antimicrobial resistance. Together they should develop mechanisms to work cooperatively and constructively to understand the health systems, societal, and economic drivers of inappropriate antimicrobial use, share good practices, limit harmful practices and achieve the goal of responsible use of antimicrobials in humans. These mechanisms are needed to drive locally appropriate and sustained action.

We also agreed that assuring access to appropriate and effective antimicrobial medicines is an integral part of the universal health coverage agenda, as well as maintaining effectiveness of antimicrobials.

This consultation recommends that the following issues that received support during the meeting should be strongly considered during the final formulation of the Global Action Plan on Antimicrobial Resistance:

1. All nations should develop and implement national action plans, including awareness campaigns based on a good understanding of social and cultural realities, for combating antimicrobial resistance and promoting responsible use of antimicrobials, based on a multi-sectoral One-Health approach.
2. Infection prevention and control is essential for minimizing the development of antimicrobial resistance and needs to be prioritized across health care systems.
3. All nations should commit to improving and ensuring universal access to essential vaccines, rapid diagnostic tools, and effective antimicrobials, and to the further development of these important tools.
4. All nations should implement antibiotic stewardship programs across their health care systems. In support of this, the international community should establish a framework (including standards and metrics) to support stewardship efforts, and countries with established expertise should assist other countries to set up their own stewardship programs. For those countries with limited resources and internal capacities, international assistance with financial, material and technical support should be an important consideration.
5. Evidence-based treatment and stewardship guidelines, adjusted for local resistance patterns, epidemiology and differences in health systems, need to be developed, implemented, monitored and evaluated to guide health professionals and other providers in appropriate and sustainable use of antimicrobials.
6. Regulation and assurance of the efficacy, safety and quality of antimicrobials, addressing the full supply and

<sup>iii</sup>The One Health concept addresses issues of infectious diseases and their control at the interface between human health, animal health, food and agriculture, and the ecosystem, recognizing that infectious organisms often cross species in ways both known and unknown.

- distribution chain, needs to be implemented in all countries.
7. International collaborations should be initiated to address the problems of substandard/spurious/falsely-labelled/falsified/counterfeit medical products as part of the efforts to ensure responsible distribution and dispensing of antimicrobials of good quality, particularly in areas with limited access to health care.
  8. Local, national, and international monitoring systems on distribution and consumption of antimicrobials and current resistance patterns (including regional and sub-regional approaches to address cross-border dynamics including areas of conflict, high mobility, and refugees) should be developed and implemented. This information needs to be made publicly available to support an understanding of extent, trends and impact of antimicrobial resistance in all countries using common, validated surveillance methodology.
  9. Education and continuing professional education of all health workers who dispense or promote the use of antimicrobials, should include strong elements on the threat of antimicrobial resistance, the drivers and dynamics of antimicrobial resistance, and antibiotic stewardship and other measures to avoid, minimize and mitigate the spread of antimicrobial resistance.
  10. Healthcare providers and health professionals should take greater responsibility for promoting responsible use within their communities, including engaging in awareness raising and educational activities among their peers and the public to encourage behavioral change to optimize the effective use of antimicrobials.
  11. Access to antimicrobials should be by prescription only or by a similar form of authorization appropriate to the local health care system (e.g., dispensing based on regionally appropriate guidelines).
  12. National authorities should implement reimbursement schemes that encourage responsible and appropriate use of antimicrobials.
  13. Financial incentives and marketing that stimulate inappropriate antimicrobial prescribing and dispensing practices (including use of broad-spectrum agents, inappropriate prescriptions, dosages or pack sizes, or wrong route of administration or duration of treatment) should be eliminated through legislation or other nationally appropriate measures.
  14. Direct-to-consumer-marketing of antimicrobials should be prohibited or tightly regulated in all countries. Although some participants expressed the view that all such marketing should be fully prohibited, consensus was not reached on this point.
  15. Antimicrobial manufacturers, importers, wholesalers, and distributors should adopt a code of conduct, limiting the marketing of antimicrobials, while promoting their appropriate use as part of antibiotic stewardship.
  16. Medically-important classes of antimicrobials should be restricted to clearly defined criteria for the use of selective medical practitioners only, aimed at preserving the effectiveness of these medications while assuring accessibility and affordability to low income populations. Although some participants expressed the view that new classes of antimicrobials should be restricted to humans only, consensus was not reached on this point.
  17. Countries should regulate and enforce control measures on manufacturing waste from production of antimicrobials, and other routes by which antimicrobially active substances, their constituents and byproducts are released into wastewater, soil and air, and should monitor possible impact on the environment and the biosphere.
  18. The success of the Global Action Plan is dependent upon international and intersectoral collaboration, to support the development of implementation mechanisms. International bodies should explore ways to strengthen intersectoral collaborations and discuss possibilities for international agreements to combat antimicrobial resistance, including full use and application of the core capacities of the International Health Regulations (2005).