



## Health Related Water Microbiology Specialist Group Newsletter

*Volume 18 - December 2018*

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### Message from our chair

Microbial pollution is a worldwide problem, threatening both developing and developed countries. There is a variety of methods available to treat water/wastewater; some are important for sustainability and others promote safety (e.g., advanced oxidation processes, reverse osmosis membrane and UV irradiation). Some of these technologies are efficient in reducing pathogenic microbes and will be included in the field of direct potable reuse while natural systems such as stabilization ponds might be considered for their low energy requirements. Regulation on recreational water is also a growing concern, which may be impacted by climate related events such as heavy rain storms and flooding.

Our group can solve these issues from a microbial safety view point, and it is time for us to contribute to society.

I, as the chair of the HRWM group, am excited to see the advances in this field at the upcoming WaterMicro conference in Vienna. I hope most of you will join the event.

Hiro Katayama

# 20<sup>th</sup> International Symposium on Health Related Water Microbiology

15 – 20 September 2019,  
Vienna, Austria

The preparatory work of the **symposium program** is in progress. It will cover all aspects of health related water microbiology in the whole water cycle, applied and basic research on water and microorganisms as it impacts human health. Main topics include among others research on pathogenic bacteria, parasites and viruses, microbial indicators, modelling associated risk and microbial source tracking tools, as well as water treatment and disinfection, water reuse, recreational water, water management in disaster situations and extreme events, antimicrobial resistance, as well as water quality and infection control in health care facilities. Contributions related to the UN Sustainable Development Goals (SDG) are particularly welcome.

The **IWA Young Water Professionals** ([www.iwa-network.org/young-water-professionals](http://www.iwa-network.org/young-water-professionals)) are an active part in the symposium organization and program and are especially encouraged to submit abstracts. The three best abstracts authored by an YWP will be awarded with **free registration fee**. Submit your abstract on-line (Conference Website) and send your application and CV to: [elias.gmeiner@meduniwien.ac.at](mailto:elias.gmeiner@meduniwien.ac.at)

**Five scholarships** for authors of best abstract from **developing countries** will be funded by our SG HRWM. The bursary includes free registration fee and a financial support of EUR 1,500. Submit your abstract on-line (Conference Website) and send your application and CV via email to: [regina.sommer@meduniwien.ac.at](mailto:regina.sommer@meduniwien.ac.at)

All **abstracts** will be reviewed and summarized in an abstract booklet. After the symposium, board members will recommend authors of excellent studies to submit full paper to WST or JWH. In the submission a recommendation letter from HRWM board members will be included.

**Workshops** are under preparation on the topics “Biological risks of WWTP workers”, “QMRA\_catch approach” and in cooperation with WHO: “Antibiotic Microbial Resistance” and “Coliphages as additional faecal indicators”.

We are pleased that the **IWA Specialists Groups** SG Disinfection (Chao Chen, China and Andrea Turolo, Italy) and SG Resource Oriented Sanitation (Günter Langergraber, Austria) have expressed their interest in contributing to the symposium program.

**We invite you cordially to submit abstracts!**

**Important dates are:**

15 January 2019: Submission opens for abstracts, abstracts for YWP and scholarships for authors from developing countries  
15 April 2019: Submission closes  
30 May 2019: Notification of acceptance  
30 June 2019: Early Bird Registration Deadline

Besides the scientific program enough time for networking, enjoying company and good food in a relaxing atmosphere is foreseen. Possibilities for technical excursions will be offered. The open meeting of the SG HRWM will be held on Wednesday, September 18, 2019.

The **conference venue** is the Campus of the University of Vienna (founded in 1365), which combines modern infrastructure and historic flair. The campus is located within walking distance to the city centre and can be easily reached by public transport. Address: 1090 Vienna, Spitalgasse 2.

The Austrian Society for Hygiene, Microbiology and Preventive Medicine supports our symposium in organizational matters.

Conference Website: [www.hrwm.eu](http://www.hrwm.eu)

We are looking forward to welcome you at HRWM 2019 in Vienna! Regina Sommer and Andreas Farnleitner (conference chairs) for the Team of ICC Water & Health



## Invitation to Host WaterMicro 2021

**Call for applications to host WaterMicro2021  
(Closing Date 17 April, 2019)**

**Contact:** Daisuke Sano at  
[daisuke.sano.e1@tohoku.ac.jp](mailto:daisuke.sano.e1@tohoku.ac.jp)

Health-Related Water Microbiology (HRWM) is one of the Specialist Groups of the International Water Association (IWA). Our group was the first of the specialist groups, installed in 1977 as Water Virology Specialist Group (within the former IAWPRC). The Specialist Group is a forum for the exchange of scientific information in the field of health-related water microbiology. This encompasses many fields of expertise: from environmental to clinical virology, bacteriology and parasitology, from infectious diseases epidemiology to risk assessment methodology; from water treatment engineering to environmental health practice.

The IWA SG on HRWM organizes the international symposium biennially and our members play a key role in deciding on the venue and planning the symposia. We cordially invite our SG members to propose venues to host WaterMicro2021. In order to host the conference, it is necessary to ensure you can provide the following:

- Team (including experience running conferences)
- Suitable venues and facilities for the conference session for about 300 participants.
- What country can offer (water issues/experience/differences)
- How above fits into global HRWM
- Hotel accommodation for approximately 300 participants.
- Meals (i.e. coffee/tea breaks and lunch) for approximately 300 participants.
- A social-cultural programme.

The venue for WaterMicro2021 will be decided by a vote in the open business meeting during WaterMicro2019 at Vienna. HRWM Management committee will ask the applicants to give invitation speech prior to the vote.

You can find the application form at <https://hrwm-watermicro.com>, or ask HRWM Secretary via email: [daisuke.sano.e1@tohoku.ac.jp](mailto:daisuke.sano.e1@tohoku.ac.jp)

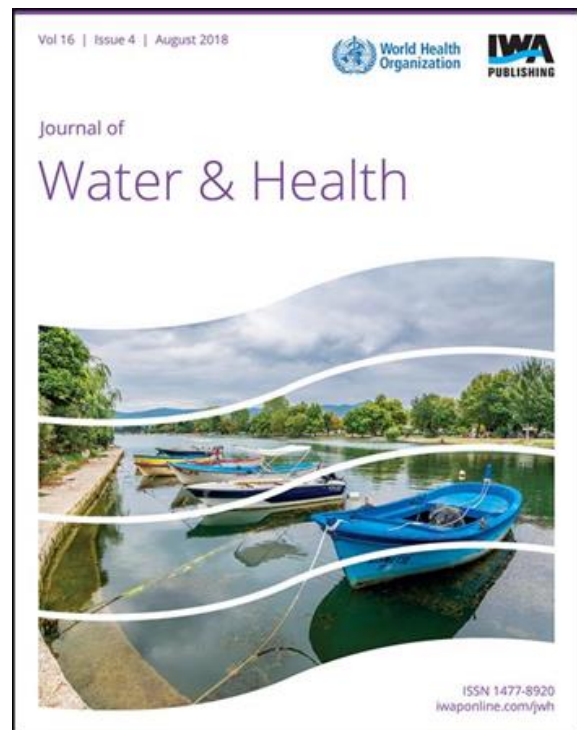
Applications should be submitted to the Secretary of HRWM SG via email

([daisuke.sano.e1@tohoku.ac.jp](mailto:daisuke.sano.e1@tohoku.ac.jp)) by 17 April, 2019.

## Journal of Water and Health

In order to enhance the global reach and impact of the Journal of Water and Health, IWA Publishing has partnered with Knowledge Unlatched, a program which crowd-sources funding from libraries across the globe to make journals Open Access. Should sufficient funding be achieved through the program, Journal of Water and Health will be flipped to Open Access in January 2019. Open Access publication fees will be waived for all authors in for the first three years.

The principal objective of the initiative was to facilitate the effective and efficient removal of nutrients and pathogens in effluent streams in Wastewater Treatment Works (WWTW). These contaminants pose a risk to the health and development opportunities of downstream communities and water users and threaten the integrity of water resources.



## Huw Taylor Prize

Closing Date:

17 April, 2019)

No late submissions  
will be accepted.

Contact:

Nicholas Ashbolt at  
[ashbolt@ualberta.ca](mailto:ashbolt@ualberta.ca)



### Background

The Health-Related Water Microbiology (HRWM) Specialist Group of the International Water Association (IWA) will honor Huw Taylor by establishing a continuing award to be presented in his name every two years to a deserving investigator. It is the HRWM Board's unanimous decision to establish this prize and award Professor Huw Taylor with the first prize in recognition of his exceptional contribution to the Health-Related Water Microbiology science field and to the HRWM Specialist Group.

His outstanding research has been instrumental to the development of Microbial Source Tracking as scientific method and later application tool to identify contamination sources, both in developed and developing settings, from mapping contamination sources in river and marine systems in the UK and Europe, to mapping and managing disease transmission in Indian megacities. His research is providing water and sanitation solutions in Haïti, West Africa, Brazil, Malawi, Kenya, Nepal and India. He assisted the NGO Médecins Sans Frontières in Haïti during the cholera outbreak that followed the 2010 earthquake to design a safe treatment system for cholera hospital wastewaters. He coordinated an international WHO expert team to advise on the sanitation response in the Ebola outbreak in West Africa in 2014-2016. He is developing novel-low cost approaches to disinfecting human waste in emergency settings and microbial source tracking methods.

The second Prize will be announced during the HRWM biennial meeting in Vienna, Austria in 2019. Details (see below) pertaining to the prize will be described to the HRWM membership in the HRWM newsletter.

### Objective

To assist and encourage using outstanding research in the field of health-related water microbiology that is applied to provide water

and/or sanitation solutions in emergency and/or developing settings.

### Criteria

- Nominees may be students and researchers that have produced outstanding research in the field of HRWM to provide water and/or sanitation solutions in emergency and/or developing settings.
- Nominees have conducted research in the abovementioned settings and the research has led to (or is leading to) tangible solutions in water and/or sanitation to improve the health of the population in this setting.
- Nominees should generally have published their research in peer-reviewed journals.
- Nominees must be members in good standing of the IWA-HRWM Specialist Group.

### Nomination Process

- Candidates may be nominated by IWA-HRWM members, their institution of higher learning, or other organization involved in the HRWM field.
- Nominations must include the name, address, age, educational background, relevant employment history, and HRWM experience of the nominee.
- Nominations must include a narrative summary, not to exceed two typed pages, supporting the qualifications of the nominee and the basis for the nomination.
- The HRWM Huw Taylor Prize selection committee must receive nominations not later than six months prior to the next scheduled HRWM biennial meeting.

### Selection Process

- A standing committee to be known as the Huw Taylor Prize Committee will review nominations for the award.
- The Huw Taylor Prize Committee will consist of HRWM members recommended by the existing nominations/recruitment committee and appointed by the HRWM chair.
- The Huw Taylor Prize Committee will consist of at least three members, at least one of which will be an HRWM board member or officer.
- Huw Taylor Prize Committee members will serve four year terms and one member will be replaced every two years.
- The Huw Taylor Prize Committee will be the final authority in the selection of the awardee.
- The Huw Taylor Prize Committee will complete its review and make a selection

known to the HRWM Board not later than 5 months prior to the next HRWM biennial meeting.

- A successful candidate will be notified of the award by the HRWM Chair not later than 5 months prior to the next HRWM biennial meeting.

#### **Nature of Prize**

- The award will consist of a prize statue, a framed certificate identifying the recipient, and a stipend for registration costs associated with the IWA-HRWM Specialist Group meeting scheduled for the year of award.
- Huw Taylor Prize recipients are expected to give a presentation on their work during the meeting for which they receive the award.

#### **Prize jury**

- Prof. Nicholas Ashbolt (Chair), Canada
- Dr. Celia Barardi (Secretary), Brazil
- Dr. James Ebdon, UK
- Prof. Gertjan Medema, Netherlands

#### **Deadlines**

Application Deadline: 17 April, 2019

Award Notification: 10 May, 2019

#### **Applications should include the following:**

- Completed Nomination Form
- At least one letter of support, giving the basis for nomination and supporting the qualifications on research on which the nomination is based (free format).
- Curriculum vitae of the nominee (free format).
- 

Applications should be submitted to the Chair of the Award Committee via email ([ashbolt@ualberta.ca](mailto:ashbolt@ualberta.ca)) by 17 April, 2019.

You can find the application form at <https://hrwm-watermicro.com>, or ask HRWM Secretary via email: [daisuke.sano.e1@tohoku.ac.jp](mailto:daisuke.sano.e1@tohoku.ac.jp)

#### **Curriculum Vitae**

Enclose a current CV for the candidate.

#### **Letter(s) of Support**

Enclose at least one letter in support of the nomination, testifying the contributions of the candidate to the Health-Related Water Microbiology field and work in developing countries if applicable.

*Applications should be submitted to the Chair of the Prize Jury via email ([ashbolt@ualberta.ca](mailto:ashbolt@ualberta.ca)) by 17 April, 2019.*

## IWA-HRWM Willie Grabow Young Investigator Award

Closing Date 17 April, 2019)

No late submissions will be accepted.

Contact: Bettina Genthe at

[bgenthe@csir.co.za](mailto:bgenthe@csir.co.za)

#### **Background**

The IWA-HRWM Willie Grabow Young Investigator Award was officially announced in June 2009 during the 15th International Symposium on Health Related Water Microbiology, WaterMicro 2009, in Naxos, Greece. Professor Willie Grabow, a brilliant environmental virologist, dedicated part of his professional life to implementing the IWA and specialist group concept, and giving technical and scientific support to developing countries in the environmental microbiology field. He continues to inspire emerging scientists. The award, generously sponsored by IDEXX Laboratories, Inc. is presented biennially in conjunction with the HRWM Symposium.

#### **Objective**

The IWA-HRWM Willie Grabow Young Investigator Award is made for the purpose of assisting and encouraging young scientists, who are doing outstanding research in the field of health-related water microbiology, specifically in developing countries.

#### **Award**

The award consists of a stipend for travel, lodging and registration costs for the HRWM Symposium the year of the award (not to exceed US \$4,000 (four thousands US dollars)). In addition, a plaque will be presented to the recipient at the Symposium's Gala dinner. The Award winner will be asked to give a presentation on their work applicable to developing countries during the Symposium.

#### **Nomination Process**

A candidate must be nominated. Nominators may be HRWM members, schools or other organizations involved in the Health Related Water Microbiology field.

#### **Selection Criteria**

Candidates need not be a current Member of IWA, although they should preferably have some past involvement in the HRWM Specialist Group and are encouraged to become an IWA member.

To be eligible for the Award, a nominee shall not be older than 35 years on the deadline date for applications (17 April, 2019).

Candidates conducting research in a developing country will have advantage in the selection process.

Research published in peer-reviewed journal(s) will be considered an advantage in the selection process.

### Evaluation Process

Award Submissions will be received by the Chair of the Award Committee. Submissions will be compiled/organized and distributed for review by the Committee. Candidates not in compliance with application rules will be disqualified. The selection criteria will drive the evaluation process. In judging the candidates research the originality shown and the major contributions in the area of health related water microbiology will be considered. Results of the application will be sent to the applicants. The decision of the Award Committee will be final.

### Award Committee

- Ms. Bettina Genthe (Chair), South Africa
- Dr. Andreas Farnleitner, Austria
- Dr. Alexandria B Boehm, USA.

### Deadlines

Application Deadline: 17 April, 2019

Award Notification: 10 May, 2019

### Applications should include the following:

- Completed Nomination Form
- At least one letter of support, giving the basis for nomination and supporting the qualifications on research on which the nomination is based.
- Curriculum vitae of the nominee.

You can find the application / nomination form at <https://hrwm-watermicro.com>, or ask HRWM Secretary via email: [daisuke.sano.e1@tohoku.ac.jp](mailto:daisuke.sano.e1@tohoku.ac.jp)

### Curriculum Vitae

Enclose a current CV for the candidate.

### Letter(s) of Support

Enclose at least one letter in support of the nomination, testifying the contributions of the candidate to the Health-Related Water Microbiology field and work in developing countries if applicable.

Applications should be submitted to the Chair of the Award Committee via email ([bgenthe@csir.co.za](mailto:bgenthe@csir.co.za)) by 17 April, 2019.

## Call for Nominations – HRWM Management Committee (MC)

**We are looking for members for the Management Committee! Open call starting in February 2019!**

An open call for Nominations to Management Team will be sent via email to all IWA members by Lisa Andrews, IWA Specialist Groups Officer. If you are interested in group management and would like to contribute to our group success please submit your nomination. **Young Water Professionals** are especially encouraged to participate. The current Management Team members will be able to re-nominate themselves as well to express their interests to continue. After the new MT is elected, MT members among themselves will self-nominate and elect for the group chair and secretary position.

## IWA Fellows

Two HRWM SG leaders, Prof. Gary Toranzos (University of Puerto Rico) and Prof. Nicholas Ashbolt (University of Albert) have been appointed as IWA Fellows based on their significant contributions as scientists and educators.

They will serve as IWA Fellows for 5 years, and during that time they will represent the IWA through relevant activities, including HRWM events and meetings, and support the IWA and SG missions.



Figure 1: Prof. Gary Toranzos (left) and Prof. Nicholas Ashbolt (right)

## YWP News

### YWP, 2019, Canada

In December, we will open registration for young water professionals to attend the International Young Water Professionals Conference, held in Toronto Canada (23-27 June 2019). Whether you submitted an abstract, workshop proposal or you simply want to benefit from the professional development offered, how can you start justifying budget for your travel next year now? [Use our Justification Pack](#) and get approval for travelling now, so you can [register](#) next month at early bird rates.

### Call to organize YWP activities at Water and Development Congress

Build your network, develop your skills, and contribute to integration and professional development of young water professionals in our Congress.

## Workshops and meetings

### ***Workshop for the Global Water Pathogen Project and WHO: The Action Plan on Antimicrobial Resistance and Water Environment at IWA World Water Congress & Exhibition (16-21 September 2018, Tokyo, Japan)***

At the G20 health ministers meeting (May 2017), antimicrobial resistance (AMR) was raised as important for the international agenda. AMR is not only a major threat to the global health, but also our future economies. More than 700,000 people worldwide are already dying each year because of AMR agents. While the relative role of the environment is unclear at this stage, an important first step is to identify hotspots of AMR spread and human exposure, and explore (model) possible benefits of actions to cut/reduce the load of AMR agents into environmental compartments.

IWA Health-Related Water Microbiology Specialist Group organized a workshop for the Global Water Pathogen Project and WHO: The Action Plan on Antimicrobial Resistance and Water Environment at IWA World Water Congress & Exhibition (16-21 September 2018, Tokyo, Japan). This workshop was designed to explore the potential contribution

of environments to the spread of AMR agents by evaluating the status of knowledge on the relationship between AMR and environments. Facilitating the exchange of recent information between academics and those involved with current WHO and National Action Plans for AMR, and to aid in identifying effective practices of Water, Sanitation and Hygiene (WASH) on AMR.

### **The objectives of this workshop were:**

To update the knowledge on the role of water, sanitation and wastewater in combatting AMR,  
To review the WHO and National Action Plans for AMR from the viewpoint of WASH, and  
To identify priority activities for academics and WASH intervention practices.

### **Key points from the presentations were as follow:**

- Exposure to AMR in circular economy and water reuse is concerned.
- ARG transfer can be recovered/accelerated by better nutrient condition
- Quantifying drivers of environmental AMR needs to be based on one health approach
- AMR risk mitigation requires effective linking between quality and quantity of data reported on drivers of AMR in humans
- Identification of the levels of management needed in hot spots where mixing of pathogens, mobile elements and ARGs are higher
- What are the reference pathogens to be used in QMRA of AMR?
- Is it enough to consider only hot spots?
- Availability of dose-response data is important to estimate disease burden
- Is it reasonable to use 10<sup>-6</sup> DALY as the benchmark risk?
- The accumulation of mutagens/DBPs in biofilms formed on UF/RO membrane, caused by the concentration polarization, may increase the mutation/HGT frequency, which can enhance the acquisition of antimicrobial resistance.

### **Key recommendations/solutions presented are as follow:**

#### **- One health action plan against AMR**

- Minimizing the discharge of and exposure to antibiotics and ARB/ARG in to water environments

- Interventions leading to reduce the exposure to ARB/ARG
  - Development of new water treatment systems to minimize the discharge of antibiotics and ARB/ARG
  - Guidance on AMR and water systems in healthcare settings
  - Foster harmonized global monitoring of AMR
  - Selecting AMR indicators for evaluating WASH interventions
  - Water quality target development for antibiotics and ARB/ARG
- QMRA of AMR requires models suitable for aggregating (missing) data**
- Bayesian networks (Bayes Net) for assembling the collection of AMR data
  - Usage of utility function (Utils as quality adjustment weights in DALY and QALY), Von Neumann-Morgenstern utility theorem
- WHO global action plan on AMR**
- Improve awareness and understanding
  - Strengthen knowledge through surveillance and research
  - Reduce the incidence of infection
  - Optimize the use of antimicrobial medicines
  - Ensure sustainable investment

**Quotes from speakers/audience are as follow:**

- “Where does AMR in water fit in general management of AMR?”
- “There are many identified hot spots. Where should we spend money to address AMR problem?”
- “Presence of ARGs is not surprising. They have been identified in mummies also.”
- “How to control usage of antibiotics?”
- “We need good sanitation first.”
- “Obtaining the support from highest level government authorities.”
- “Education is also important.”

## Workshops and meetings

***Strengthening antibiotic stewardship: a quest to protect our resources, environment and our health (14 November 2018, North West University, South Africa).***

The discovery of antibiotics revolutionized modern medicine. Ironically, the fate of modern medicine as it relates to the health of humans and animal now hangs in the balance due to the incorrect use and handling of antibiotics. Antibiotic resistance phenomenon—a consequence of misuse and overuse of antibiotics—is real and the threat it poses now resides with us. If drastic actions are not taken in the interim, the prognosis does not look good for the imminent future. Collectively, we must act decisively and fast. Time indeed is running out.

For this reason, the Microbiology group of the Unit for Environmental Sciences and Management, North-West University (NWU), South Africa under the guidance of Prof Carlos Bezuidenhout, organised two sensitization events on the 14th of November 2018 in commemoration of the World Antibiotic Awareness Week (WAAW) as declared by the World Health Organisation. These events were sponsored by the South African Water Research Commission (WRC). The speakers at the event were experts selected from the different industries involved with antibiotics production, administration and utilization. These included a veterinarian, a pharmacist, four postgraduate microbiology students, a farmer, and a director of a hospital.

The welcome address was given by Dr Nonhlanhla Kalebaila a representative from the WRC. In her address, she highlighted the mandate and role of the WRC in managing and preventing the further spread of antimicrobial resistant bacteria as well as genes in the environment. In her words “South Africa is one of the top 10 drug prescribed countries and it is predicted that by 2050, about 10 Million people would have succumbed to infections caused by antibiotic resistant bacteria (ARB).” She further gave insight into one of the approaches adopted by the WRC in combating antibiotic resistance termed “One Health approach”. This approach elucidates that all sectors of society are interconnected.

Subsequent speakers at the event shed more light on specific cases on the use and misuse of



antibiotics and the implications on the environment, animal and human health. Matron Gloria from Potchefstroom Hospital explained the various protocols in place to achieve antibiotic stewardship—responsible use of antibiotics that ensures the rate of antibiotics resistance evolution is reduced. She (Matron Gloria Mmolawa) further explained why it is important to administer first, second and third line antibiotics carefully and correctly. Thereafter, Mr Henrico Heystek a Pharmacist summarised the history of antibiotics and emphasised that practices such as good hygiene, wait and see approach to antibiotic prescription, completing the antibiotic course as prescribed and vaccination is crucial in limiting antibiotic resistance.

Dr Stallone Terera a veterinarian mentioned that sub lethal concentrations are administered to animals however it is recorded that 75% of antibiotics are passed unaltered in faeces. This set the stage for Mr CP Kriek a pig farmer that continued the conversation. He mentioned that in his enclosed farm that they follow a strict treatment regime and have various standard protocols in place to limit antibiotic misuse. He further mentioned that should there be a disease outbreak in the farm that the individual (s) is/are identified, the microbial cause is determined by means of an antibiogram sensitivity test and the best suited treatment is determined alongside the guidance of a veterinarian.

Microbiology students at the NWU also presented their work done on antibiotic resistance. It was reported that resistant genes found in the environment can survive chlorination and ozonation. Pathogens such as Clostridium perfringens have been isolated from the environment that shows antibiotic resistance by means of in-silico analysis and utilizing various bio-informatics platforms. Some postgraduate students further presented research findings from drinking and wastewater which showed the presence of ARB's and antibiotic resistant genes (ARG's) in these water sources.

Soon after the presentations, an open floor dialogue followed which deliberated on the need and appropriate practices which contribute to antibiotic stewardship. It was evident that many persons in South Africa are not familiar with antibiotics and as such it was suggested that pamphlets which contained information on antibiotics and its stewardship be designed and circulated. This will help provide enlightenment on antibiotics, translate information in vernacular, and address the link between pollution and antibiotics, detail appropriate modalities for the disposal of expired or old medicines according to regulatory specifications.

Town planners that attended the workshop learned that improvements need to be made to the treatment plants to lessen the burden of antibiotics being spread into the environment and this directly influences their work. What was evident from this stakeholder's workshop was that antibiotics and antibiotic resistance does not affect an isolated group but ultimately all of us and should be combated by everyone. Perhaps in future WAAW drives could include other antimicrobials such as household cleaning products; personal health care products etc. sold over the counter that may contain Triclosan and Chloroxylenol.



**Figure 2: Delegates who attended Stakeholders Workshop on: strengthening antibiotic stewardship**

In the evening of the 14th of November 2018, Public lectures were held on the premises of the North-West University to educate the community on the use and misuse of antibiotics, and the implications of antibiotic resistance on our environment and health. Prof Medupe (Director of Community engagement and Stakeholder relations of NWU) gave the welcome address.

There-after Prof Carlos Bezuidenhout (Research Scientist) addressed members of the community on the dissemination of antibiotics in the environment and the connection to pollution. In his Talk, he clearly demonstrated how pollution can contribute to the spread of antimicrobial resistance (AMR) by means of incorrect antibiotic and antimicrobial disposal and use, agricultural run-off, faecal run-off etc. Prof Carlos emphasised the need to educate the public on handling this resource with care. He furthermore said: "It is very important to take note of what we dispose-off into the environment; it may come back to bite us". "Antibiotic Stewardship" was the next topic discussed by Mr Nico Scheepers (Clinical Pharmacist). He revealed that South Africa has increased its antibiotic footprint over the last decade by 216% suggesting that this may be the reason antibiotic resistance is on the rise. He

thoroughly explained how to start an antibiotic stewardship program and who the role players are. According to his estimations it can take up to 6 months to establish a committee that upholds antibiotic stewardship.

Following the lectures by Prof Carlos and Mr Nico, the audience were given the platform to engage the speakers on burning questions emanating from the lectures. It was enlightening to learn that medical professionals have to be vigilant of the geographical setting in treating certain diseases/infections. Also, alternative treatment approaches may prove to be more efficient than taking antibiotics. Reflecting on the two events held, there is a definite need to have more of such awareness campaigns and more importantly, to do so by involving policy makers.



Figure 3: Prof Carlos Bezuidenhout giving a public lecture about antibiotics in the environment



Figure 4: Some of the attendees of the public lectures

## Upcoming IWA Conferences

### 1st Intermittent Water Supply Conference 7 – 9 April 2019, Kampala, Uganda



Website: [www.iws2019.org](http://www.iws2019.org)

### 12th IWA International Conference on Water Reclamation and Reuse 16 – 20 June 2019, Berlin, Germany



Website: [iwareuse2019.org](http://iwareuse2019.org)

### IWA Conference on Algal Technologies and Stabilisation Ponds for Wastewater Treatment and Resource Recovery 1-2 July 2019, Valladolid, Spain

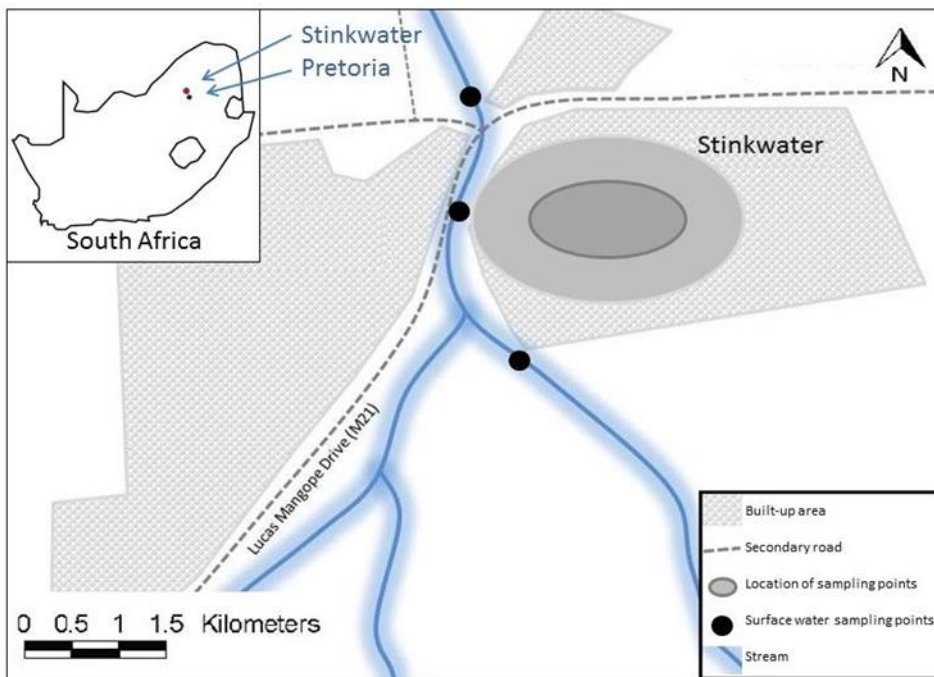


Website: [eventos.uva.es](http://eventos.uva.es)

## Water safety – empowering communities in South Africa

Researchers from the Council for Science and Industrial Research (CSIR) in South Africa embarked on a study in 2015 to examine the microbial and chemical quality of well water from a peri-urban settlement in South Africa. The study aimed to reveal potential health risks that the community may be exposed to when consuming untreated groundwater.

CSIR microbiologists Wouter le Roux and Lisa Schaefer took water samples over a two-year period from hand-dug wells in Stinkwater<sup>1</sup> and tested the water quality. Hand-dug wells are the primary source of water in this peri-urban community. Stinkwater is situated on the outskirts of the Tshwane Metropolitan area in the Gauteng Province of South Africa. The Stinkwater area houses approximately 40,000 people in dwellings that range from formal to informal type constructions.



**Figure 3: Map showing Stinkwater area with the location of the sample sites shown.**

High concentrations of faecal indicator organisms were present in the groundwater, which highlights the lack of sanitation and sewerage systems in

<sup>1</sup> “Stink” is an Afrikaans word that directly translates to “a strong foul smell or stench” in English.

the area. Nitrate concentrations often exceeded safe levels defined by the South African water quality guidelines. High nitrate concentrations can be particularly harmful to infants in the community as they are more susceptible to the effects. A quantitative microbial risk assessment was conducted by microbiologist Bettina Genthe which showed that the infection risk associated with bacterial pathogens from a single exposure event is very small. Multiple exposures, however, may place water users at significant risk. The findings emphasized the need for sustainable water quality solutions in peri-urban communities. This may include household level water treatment technologies or the provision of safe drinking water via piped-distribution systems.

In order to assist in empowering the community, the socio-cultural aspects of water usage were investigated. CSIR environmental anthropologist Karen Nortje and social scientist Elliot Moyo investigated how people use the water resources available to them. The technical analysis was combined with outreach in order to understand the community’s attitude towards water and water usage. During this process, researchers investigated how people use the resource and determined their level of understanding with regard to water safety. By identifying social gatekeepers in the community, awareness on water safety can be improved, and community members are educated about the dangers of pollutants in water.

As part of this initiative CSIR researchers visited two primary schools in the Stinkwater area of Leratong and Marotola to teach learners about the value of clean water and how to ensure that their water is safe. Through a series of mini exhibitions and games, Grade 6 pupils learnt about the various uses of water, how bacteria and viruses can hide undetected in the water, how to make sure that their water is safe by following one of three simple practices: bleaching, boiling or sunlight disinfection, and lastly, the value of water as a social commodity.

The aim of these programmes was knowledge sharing, both between science and society but

also between different members of the community. It is envisaged that these Grade 6 pupils will spread the messages by teaching their parents and neighbours through demonstrations and word of mouth, ensuring that the research has real social impact. The research team also distributed tailor-made guideline booklets to serve the community and guide municipalities on how to better serve residents. This may have accelerated the roll out of piped water delivery as in October 2018 local government released a press statement that a new pipeline was installed supplying 10 000 households in Stinkwater with water. The recent installation will allow the people of Stinkwater to enjoy a new level of service delivery.

Going forward, the CSIR research team will investigate potential water treatment interventions for the removal of nitrate at a household level. Nitrate pollution and elevated nitrate in South African groundwater is common and untested groundwater is frequently used in peri-urban and rural communities as the main drinking water source.

For more information please contact the project leader:  
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*For additional reading:*

*Abia, A. L. K., Schaefer, L., Ubomba-Jaswa, E., le Roux, W. 2017. Abundance of pathogenic Escherichia coli virulence-associated genes in well and borehole water used for domestic purposes in a peri-urban community of South Africa. International Journal of Environmental Research and Public Health 14, 320; doi:10.3390/ijerph14030320.*



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### Editor's note

We would like to make this newsletter relevant, with a balance of news and technical input from all SG members. If you have news or contributions that may be relevant or feedback to improve the newsletter, please mail your information to [msteyn@csir.co.za](mailto:msteyn@csir.co.za). The next newsletter is planned for March 2019.

