ESI Funds for health

Building knowledge & capacities

Exemplary Project

I-4-1-HEALTH - INTERREG

April 2018

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Funded by the Health Programme of the European Union

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Interreg - i-4-1-health

General information		
OP information	Title OP: Priority axis: Investment priority: Specific objective:	Interreg V Flanders-the Netherlands Smart growth (innovation) 1a. enhancing research and innovation (R&I) infrastructure and capacities to develop R&I excellence, and promoting centres of competence, in particular those of European interest 1A. Stimulating industrial research and experimental development by expanding the research infrastructure at private and public knowledge institutions and by establishing links between knowledge institutions.
Timeline	Start date: End date:	01-01-2017 31-12-2019
Budget	Total budget: Co-financing rate: EU Fund:	€ 8,483,688.70 42.54% ERDF
Beneficiary/ies	Main beneficiary: Other organisations:	Amphia Foundation Applied Maths Avans Foundation Flemish Government Center for Infectious Disease Expertise and Research (CIDER) GGD Zuid Limburg University of Ghent Catholic University of Leuven University Hospital Ghent University College Roosevelt (UCR) University Hospital Antwerp University Hasselt

		ZorgSaam Zeeuws-Vlaanderen The Health Service for Animals Elisabeth TweeSteden hospital Test farm Poultry farming Elkerliek Hospital GGD Zeeland GGD Hart voor Brabant GGD West-Brabant GGD Limburg-Noord GGD Brabant-Zuidoost Admiraal De Ruyter Hospital Utrecht University, Farm Animal Health University of Antwerp Academic Hospital Maastricht
Category of intervention:	N/A	
Contact details	Name: Organisation: Role in project: Phone number: Email address: Name: Organisation: Role in project: Phone number: Email address:	C. (Carlien) van der Lienden Amphia Hospital, Laboratory for Microbiology and Infection Prevention Management Assistente Projectmanagement i-4-1-Health project +31 (0)6 46 89 81 85 i41Health@amphia.nl Jan Kluytmans Amphia Hospital, Utrecht University Project Coordinator +31 76 5953015 jankluytmans@gmail.com
Project website	https://i41health.eu	
Thematic block covered	Thematic block 4: Research and Innovation in health and life sciences	

Project summary

I-4-1-Health investigates the control of antimicrobial resistant bacteria. Resistance is a threat for humans and animals. Patients with an infection caused by resistant bacteria are more difficult to treat than patients with an infection caused by susceptible bacteria. As a result, they usually are sick longer and more severely and can die. i-4-1-Health maps out resistance with the aim to prevent, control and combat future resistance.

Bacteria spread easily. Between people, from people to animals and vice versa. That is why i-4-1-Health maps resistance and spread in both humans and animals. The spread of bacteria knows no boundaries. That is why the research takes place in the border region Flanders-Netherlands. This cross-border character and the fact that both humans and animals are simultaneously mapped out in the same way makes this project unique.

Development of IRIS

Measuring is knowing. In order to measure and identify contamination risks in the same way, i-4-1-Health develops a method: the Infection RIsk Scan (IRIS). The IRIS enables users to visualise infection risks through an app. The IRIS measures various risk factors that influence the incidence of infection and the spread of resistant bacteria. Think of processes that can be influenced by people such as cleaning, hand hygiene by care providers, and the proper use of medical devices and antibiotics. In addition, the IRIS looks at outcomes, such as carriage of resistant bacteria and their spread. Through this complete and comparable overview of infection risks, targeted improvement actions can be used that help to reduce infections.

The occurrence of resistant bacteria

The i-4-1-Health project maps the presence of resistant bacteria that occur in the intestine of humans and animals in the border area. In order to be able to investigate this, a small amount of feces is examined at the laboratory. People will be asked to put a small amount of feces in a plastic collecting pot or to streak along the outside of the anus with a cotton swab and then place this swab in a tube of liquid. In people, a distinction will be made between healthy persons and patients. In pig and poultry farming, feces of animals will be collected in plastic collecting jars.

Spread of resistance unraveled

Upon arrival of the cotton swab or the jar with stool at the laboratory, it is examined whether resistant bacteria are present. If resistant bacteria are found, a DNA profile will be made from a number of specific resistant bacteria. By comparing different DNA profiles with each other, it is possible to demonstrate transfer of bacteria. This applies both to transfer within and outside the institution, but also between humans and animals. This is interesting to investigate in a larger area with different countries such as the Flanders-Netherlands border region.

Development and Implementation

Initiator/trigger	Several factors concurred to trigger this project: 1. The idea for a cross-border collaboration to better understand and solve the phenomenon of antibacterial

	resistance was suggested by a previous project, which involved a successful cross-border collaboration between Germany and the Netherlands (EUREGIO MRSA-net Twente/Münsterland – a Dutch-German cross-border network for the prevention and control of infections caused by methicillin-resistant Staphylococcus aureus). 2. The beneficiaries of the project were interested in fostering a collaboration between Belgium and the Netherlands in the topic of antibiotic resistance. While microorganisms travel across the frontiers, both in humans and animals, the health systems in each country are not connected, and each system has a different way of dealing and even reporting the problem. Clinical guidelines used for screening patients going to healthcare or community centres are different in each country. The same goes for healthcare workers. This impairs the exchange of people across the border. 3. These differences create opportunities for mutual learning, which are a central part of this project's aims.
Project objective	To develop a cross-border collaboration between Belgium and the Netherlands in the field of antibiotic resistance, encompassing both humans and animals within hospitals, community centres and veterinarian centres with the aim of measuring the problem in an objective and reproducible way. Measurement is key to understanding this problem, and the project's IRIS (Infection Risico Scan) will allow a more objective and reproducible way of gathering information about the problem and looking at the different outcomes that follow each of the different approaches used (e.g. clinical guidelines for screening, treatment, etc.) in each of the involved countries/regions.
Target group(s)	This project follows a "One health" approach, which means that it involves the collaboration of multiple sectors to achieve better public health outcomes, in this case, both for human health and for agricultural and animal health. The results of the project will directly benefit the institutions in charge of dealing with antibiotic resistance (hospitals, community centres, and agricultural/veterinarian services). It will also benefit patients with infections and potentially, the whole population at risk.
Project health-related indicators	No health-related indicators have been set. The main indicator relates to the level of implementation of the measurement system.
Results	
Expected/attained results, outcomes and potential impacts	The main expected result is the objective and reproducible measurement of antibiotic resistance across the cross-border institutions involved in this study, which will allow to identify differences in the outcomes and, in the long term, could also facilitate the use of best practices and hence, the improvement of outcomes in terms of patient safety.

	While in the short term, the aim of this project is to develop this objective and reproducible measurement of antimicrobial resistance, in the long-term, the availability of more objective information will facilitate the changes needed for adopting best practices to deal with this important challenge. We expect that this will subsequently lead to a better control of the problem.
Success factors & Challenges	One important success factor has been the enthusiasm among the participants in the project, which includes hospital workers, community centres and agricultural centres across the border of Belgium and the Netherlands. While implementing an objective and reproducible measurement of the problem was a difficult one, it has been met with enthusiasm, and this has facilitated the measurement of unexpected differences between the systems under the study. One challenge in the implementation of this project has been the multiple hurdles associated with the need to obtain the approval of Ethical Committees in different hospitals and care centres, which follow different rules and processes. Complying with privacy and ethical rules has required important efforts and has taken a relatively long time before obtaining the approval.
Potential for replication	Once the system for measurement was developed within this project, the potential for replication in other countries, and especially at the level of cross-border collaborations, is enormous. It will be easy for others to use a similar methodology to evaluate the entity of the problem of antibiotic resistance in other countries.
Wider context	
Relevance of the project to the objective of the relevant thematic block	The project directly contributes to the development of more efficient ways of measuring the differences across health institutions in terms of dealing with antibiotic resistance. The project uses two innovative tools: (1) the IRIS scan, which allows to measure in an objective and reproducible way the infections prone to antibiotic resistance; and (2) high-throughput, whole genome sequencing, which is an innovative tool that has never been applied at the level used by this project, to the study of resistant bacteria.
Relevance of the project objective to the specific objective of the OP	The project directly contributes to the specific object of “stimulating industrial research and experimental development by expanding the research infrastructure at private and public knowledge institutions and by establishing links between knowledge institutions”, by fostering a cross-border collaboration between research and clinic institutions (both human and animal health) in finding innovative solutions to antibiotic resistance; it expands the existing research infrastructure and contributes to generate links between the partner institutions.

Relevance of the project towards reducing health inequalities	N/A
Relevance of the project towards the reform of health systems	This project, in the long run, will contribute towards more effective health systems, by making the current problems linked to infection control and antibiotic resistance visible and measurable. Currently, most hospitals are neglecting the issue of safety; in the long-term, the results of this project will potentially help to initiate changes needed to cope with the growing challenge of antibiotic resistance, by making it more manageable.
Relevance of the project objective to the national context and policy goals	N/A
Relevance of the project objective to health policy goals at EU level	Antibiotic resistance is an emerging and high-priority issue both at the national as well as at the EU level and globally. This is outlined in several documents, including “A European One Health Action Plan against Antimicrobial Resistance”, adopted in June 2017. This project contributes to the objectives laid out in that document, especially with regards to improving One Health surveillance and reporting of antimicrobial resistance and antimicrobial use, and with regard to producing more evidence-based analysis and data.