



Deliverable D-JIP2-1.4:
Annual report
Workpackage 1

Responsible Partner: RIVM

Contributing partners: WBVR, Bfr, APHA,
IZS-AM, SVA

GENERAL INFORMATION

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Leader	Kitty Maassen
Other contributors	RIVM, WBVR, Bfr, APHA, IZS-AM, SVA
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Summary progress report 9M

Summary of the work carried out in the JIP

The main start of the Cohesive project was with the kick-off meeting in March in Amsterdam. The approaches of the different WPs were discussed with the participants. Also representatives of the ORION project, EFSA and the EU were present and took part in the discussions. It was decided to have several workshops parallel in November, in order to prevent too much travel. Also connecting to EFSA and ECDC was again emphasized. A meeting was held at ECDC in June as well as direct contact with EFSA specifically for WP4.

For WP2 the main goal is to develop guidelines for **national** One Health structures (such as present in for instance The Netherlands and UK) or other ways to strengthen human-veterinary collaborations, with the aim to improve signaling, risk assessment and response by better communication, (early) exchange of information, sharing of knowledge and joint forces. This is most important for (re)emerging pathogens, but also the response to notifiable pathogens will profit from better collaboration. Since countries are very different in many aspects, no blue-print can be made for such One Health structures. The guidelines should provide information, checklists and approaches to set-up or strengthen human-veterinary collaborations taking into account the specifics of countries. In order to achieve this, an inventory via a questionnaire is being set up to gather general and specific information of the different member states (MS). The results of the inventory will be used as input for the workshop planned to be held in November 2018.

Within WP2 another goal is to develop a tool (possibly an decision tree) to help decide which tool/model best to use for the risk assessment for the specific situation in which it is needed. A literature review is performed on existing tools for risk assessment, information from other lists with such tools is used and a questionnaire is sent out, but not all data are back yet. The inventory is an open document that can be expanded during the course of the project. The inventory is input for further discussion on the decision tree (or other tool) in the November workshop.

Within WP3 is started with exploring current ways of exchanging signals between countries by contacting them directly. Also, some questions on this topic are included in the questionnaire mentioned under WP2 and will be used as input for the workshop in November. The same holds true for the task with respect to Horizon scanning. Also, a literature review is performed to determine what methods are currently used.

The main activity performed by the WP4 of COHESIVE (Data platform to facilitate risk-analysis and outbreak control) during the first 6 months of the project was to co-ordinate our activities with those of other EU projects (especially IA-1-ORION and COMPARE) to avoid duplications, and to build a strong interconnection with EFSA and ECDC. WP4 of COHESIVE is aimed at creating national structures for the analysis of WGS and epidemiological data, for the tracing of outbreaks of foodborne infections and the risk assessment. These national information systems should be harmonized with the future EU Joint Database EFSA/ECDC. Since the activities of COHESIVE are carried out in parallel with the design and implementation of the EU Joint Database, a strong interconnection with EFSA and ECDC is necessary to ensure harmonization: this requires a continuous feed-back from EFSA and ECDC to steer the development of the activities of COHESIVE. Connections with ORION, COMPARE as well as EFSA and ECDC are made.

Progress of the integrative project: milestones and deliverables

1.1. Deliverables

JIP name	Project deliverable number	Deliverable name	Delivery date from AWP	Actual delivery date	If deliverable not submitted on time: Forecast delivery date	Comments
COHESIVE	D-1.1	Kick-off meeting	3	3		Meeting in Amsterdam
COHESIVE	D-1.2	Website/platform operational	6	Does not apply		When the website of the overarching One Health EJP fulfils our needs we will not develop our own website
COHESIVE	D-2.1	Inventory of tools for systematic risk-assessment via questionnaire	8	8		Initial questionnaire sent out by month 8, we may need longer to allow respondents to return answers. The inventory will be an 'open' record that we can add to as more partners respond

1. Milestones

JIP name	Milestone number	Milestone name	Delivery date from AWP	Achieved (Yes/No)	If not achieved: Forecast achievement date	Comments
COHESIVE	M-A2. COHESIVE.4.1	Initial workshop	2	No	Month 11	Decided to postpone the workshop so it can be held together with the workshops of WP2 and WP3
COHESIVE	M-AI2.COHESIVE.1.1	Website/platform operational	6	Does not apply		When the website of the overarching One Health EJP fulfils our needs we will not develop our own website
COHESIVE	M-A2. COHESIVE.4.2	Prioritization of requirements for risk modeling framework	6	Yes		

Progress of the integrative project

Please describe for each of the tasks in a few lines the progress made in the period M1 to M9.

1. WP1: Coordination, communication and sustainability

1.1. Task 1.1: Coordination

A steering group has been formed, consisting out of the WP leaders, deputy WP leaders and a secretary. Teleconferences are organized every 6 weeks to discuss the progression of the project as well as management issues.

Connecting to other organizations and activities (including projects) has been started. During the kick-off meeting ECDC and EFSA were invited and EFSA was present. On June 26th, representatives of the steering group have visited ECDC with participation of EFSA, to look for further collaboration between Cohesive and ECDC/EFSA. Cohesive took part in the cogwheel meeting with Compare to look for possible connections. A separate videoconference will be organized to exchange goals in more detail and find these possible collaborations. ORION and NOVA were identified as other EJP-projects to which Cohesive could relate. Both were invited to our kick-off meeting and ORION was present. The coordinator of Cohesive was present at the kick-off of ORION together with several people involved in both projects. Clear links were identified and it was agreed to keep each other informed on the progress within the projects and collaborate where fruitful, in first instance mainly within WP4.

1.2. Task 1.2: Communication/dissemination

The kick-off meeting took place on March 28-29 in Amsterdam.

Since a website is built for the overarching EJP-project, most likely no separate website will be built solely for Cohesive when it appears to meet our requirements. A summary and picture are offered to the overarching EPJ WP6 for the general website.

2. WP2. Integrated risk-analysis at the national level

2.1. Task 2.1: Development of guidelines for national One Health structures

To develop guidelines for national One Health structures an inventory is being set up to gather general and specific information of the different member states (MS). The general information will focus on geographical information such as number of inhabitants, number of domestic animals, wild life and so on. The more specific information we want retrieve is about the organization of the public health and animal sectors, already existing contacts and collaborations between the public health and veterinary public health domain as well as barriers for collaboration. The inventory will be used as input for the workshop planned to be held in November 2018.

2.2. Task 2.2: Development of structured decision making

This task has some similarities with objectives in ORION and in the EU project COMPARE and connections were made with both of these projects to identify synergies and complimentary activities. A questionnaire to collect information on risk-assessment methods has been developed and sent out. In addition, a literature search has been performed to minimize the number of questionnaires required. The results will be used as input for the workshop organized in November 2018.

3. WP3. Towards an EU zoonoses structure

3.1. Task 3.1: Explore current ways for exchanging signals between countries and cross disciplines – pathway analysis

Within this task is started with exploring current ways of exchanging signals between countries by contacting them directly. Also, some questions on this topic are included in the questionnaire mentioned under WP2 and will be used as input for the workshop in November.

3.2. Task 3.2: Select tools for Horizon scanning and signal detection

A literature review is performed to determine what methods are currently used. For the participants on the workshop on WP2 and WP3 a couple of questions on this topic are added to the questionnaire. The results will be used as input for the workshop in November.

3.3. Task 3.3: Retrospective systems analysis of detection of outbreaks

This task was started in month 6. Preparation of a generic overview of zoonotic pathogen detection system is underway.

4. WP4: Data platform to facilitate risk-analysis and outbreak control

4.1. Task 4.1: Molecular typing data and metadata – database creation

A new description of task 4.1 has been made with a more extensive explanation of the National Information Systems we are aiming to develop and their placement in the general picture. This new description is incorporated in the Annual Workplan Year 2.

Sub-Task sT4.1.1 - Workshop on data and DBs

- The workshop has been postponed to November 2018 and will be held in parallel with the workshops for WP2 and WP3. In the meantime, for the purpose of this sub-task, teleconferences have been made with COMPARE and ORION projects and a meeting has been held with EFSA (April 2018). A further meeting has been held on June 26 with ECDC to harmonize our activities and outputs with the future EU Joint Database EFSA/ECDC. Harmonization with EFSA has been discussed through repeated telephone calls and a face-to-face meeting. Refinement of Task 4.1 output is ongoing.

Sub-Task sT4.1.2: Design and implementation of DBs

- So far, a preliminary logical E-R diagram is depicted, taking into consideration comments from EFSA side during kick-off meeting. An architecture of foreseen information systems interactions and information flow has been designed and discussed during EFSA/ECDC meeting of June 26.

4.2. Task 4.2: Development of a platform-independent tracing framework

Sub-Task sT4.2.1: Evaluation of available tracing tools:

- Initial list of available tracing tools is established and made available where possible. Questions to be answered during evaluation are fixed and the evaluation process is ongoing. Partners are requested for further tools to consider. Next, a web-conference with partners (tbd) will be organized

Sub-Task sT4.2.2: Development of the tracing platform

- Server for platform is designed and set up. A restricted area is designed and developed. A data model for data collection form and database are defined. First analyses and visualizations are realized and performance needs are identified. A first web-conference with partners (tbd) will be organized

4.3. Task 4.3: Development of a platform-independent risk modeling framework

Sub-Task sT4.3.1 Requirement analysis (M1-9)

- Typical components have been identified that support quantitative microbiological risk assessment, advanced simulation techniques, documentation and extended usability. Selection of minimal models for testing and development is ongoing. As well as the prioritization of building blocks for implementation in web application of risk. Currently, also the search of models and data suitable as case study (ideally with input from project partners) is ongoing

List of planned tele- or video conferences, face to face meetings in the next year

Every 6 weeks a teleconference is planned for the steering group. After the meeting on June 26 at ECDC the steering group has met. . During the workshop which will be held in November 2018, also a meeting of the steering group will be planned. The annual meeting for all members of the project will be planned in the beginning of 2019.

Summary progress report 12M

1. Summary of the work carried out

The main start of the COHESIVE project was with the kick-off meeting in March 2018, in Amsterdam. The approaches of the different WPs were discussed with the participants. Also representatives of the ORION project, EFSA and the EU were present and took part in the discussions. It was decided to have several workshops in parallel in November, in order to prevent too much travel. Also connecting to EFSA and ECDC was again emphasized. A meeting was held at ECDC in June as well as direct contact with EFSA specifically for WP4.

On November 26/27 two workshops were held at APHA, England, which were partly combined. One workshop was dedicated to WP2 and WP3, '*One Health collaboration dealing with new and (re)emerging zoonoses*'. The other workshop '*Workshop on data platform to facilitate risk analysis and outbreak control*' was dedicated to WP4.

For WP2 the main goal is to develop guidelines for **national** One Health structures (such as present in for instance The Netherlands and UK) or other ways to strengthen human-veterinary collaborations, with the aim to improve signalling, risk assessment and response by better communication, (early) exchange of information, sharing of knowledge and joint forces. In preparation of the inventory workshop in November, a questionnaire was sent out to gather general and specific information of the different member states (MS) and was used as input for discussions during the workshop. During the workshop, experiences were exchanged, insight was obtained in existing barriers and it was discussed how to shape the guidelines.

Within WP2 another goal is to develop a tool (possibly a decision tree) to help decide which tool/model best to use for risk assessment for the specific situations in which it is needed. Information was gathered, amongst other means, via a literature review and a questionnaire. During an interactive session at the workshop, it was discussed how to continue with the decision tree (or other tool), in which the above- mentioned information was used as input.

WP3 has started by exploring current ways of exchanging signals between countries by contacting them directly. Also, some questions on this topic were included in the questionnaire mentioned under WP2 and were used as input for the workshop. For the task on horizon scanning, information was collected in the same questionnaire and will be used for further steps together with the information gathered via a performed literature review.

The first activities of WP4.1 were to coordinate the activities with those of other EU projects (especially IA-1-ORION and COMPARE) to avoid duplications, and to build a strong interconnection with EFSA and ECDC. In reaction to requests for clarification, a clearer new task description was made for WP4.1. During the workshop, the architecture of the COHESIVE information system was described in detail. The round table discussion was mainly aimed at the practical implementation of this information system at the national levels, the possible constraints that could be faced and possible solutions. In WP4.2 the physical setup of the tracing platform with initial features was realised, which will be filled step-by step with further identified relevant features. Therefore a list of available tracing tools was compiled and evaluated and prepared to be published as an own web service that can be updated in the future by partners. During the November workshop, further potential partners and interfaces were identified.

2. Work carried out in the JIP, scientific results

2.1. WP1: Coordination, communication and sustainability

JIP2-WP1-T1: Coordination

A steering group has been formed, consisting of the WP leaders, deputy WP leaders and a secretary. Teleconferences are organized every 6 weeks to discuss the progression of the project as well as management issues.

Activities to connect to other organizations and ongoing work (including projects) has started. During the kick-off meeting ECDC and EFSA were invited and EFSA was present. On June 26th 2018, representatives of the steering group have visited ECDC with participation of EFSA, to look for further collaboration between COHESIVE and ECDC/EFSA. In this meeting the contact persons for Cohesive, Karin Johansson (ECDC) and Valentina Rizzi (EFSA), were taken part. Most likely, regular telephone conferences will be organized with ECDC/EFSA and the project coordinator. COHESIVE took part in the cogwheel meeting with COMPARE to look for possible connections. A

separate video conference will be organized to exchange goals in more detail at the WP level and find these possible collaborations. ORION and NOVA were identified as other OH EJP projects to which COHESIVE could relate. Both were invited to the COHESIVE kick-off meeting and ORION was present. The coordinator of COHESIVE was present at the kick-off of ORION together with several people involved in both projects. Clear links were identified, and it was agreed to keep each other informed on the progress within the projects and collaborate where fruitful, in first instance mainly within WP4.

JIP2-WP1-T2: Communication/dissemination

Since a website has been built for the overarching OH EJP level, most likely no separate website will be built solely for COHESIVE since it seems to meet our requirements. However, the website is not used to its potential as of now. A group named COHESIVE, open for all OH EJP members is made, as well as separate groups for COHESIVE members and one only for the steering group. On the open COHESIVE website general information on COHESIVE can be found as well as the programs of the workshops, the summary and the presentations. A factsheet about COHESIVE was made and is also available via the website.

At the workshops held in November at APHA, 58 people were attending. This included one invited speaker from the Swiss confederation and our contact person from ECDC. The workshop was open for all OH EJP members, which led to participation from five additional partners, not originally part of COHESIVE; INIAV (Portugal), VRI (Czech Republic), PIWET (Poland), Surrey University (UK) and Swiss Federal Veterinary Office (Denmark). Possibilities to keep these institutes involved in COHESIVE are being investigated.

During the kick-off meeting it became clear that the language between the human-vet-food domains differs. For instance, the same terms can mean different things in different domains. It was concluded that a glossary would be important to have. First steps were made to achieve this. During the kick-off meeting of ORION, it turned out that they have a task making a glossary. It was agreed to work synergistically on this.

2.2. WP2. Integrated risk-analysis at the national level

JIP2-WP2-T1: Development of guidelines for national One Health structures

For WP2 the main goal is to develop guidelines for **national** One Health structures (such as present in for instance The Netherlands and UK) or other ways to strengthen human-veterinary collaborations, with the aim to improve signaling, risk assessment and response by better communication, (early) exchange of information, sharing of knowledge and joint forces. This is most important for (re)emerging pathogens, but also the response to notifiable pathogens will profit from better collaboration. Since countries are very different in many aspects, no blue-print can be made for such One Health structures. During the workshop held on November 26/27 at APHA, the participants were shown those differences between countries in various presentations, including one from EFSA. Next, the results of a questionnaire, filled in by participants before the workshop, were presented. The questionnaire focused on the organization of the public health, food and animal sectors, already existing contacts and collaborations between the public health and veterinary public health domain as well as barriers for collaboration. The four most mentioned barriers were further discussed in an interactive session (existing structures/regulations/bureaucracy; conflict of interests; communication/sharing of information; geographical barriers). The results of the discussions will be used when drafting the guidelines. Sharing (molecular) data is one of these topics. In an interactive session organized by members of COMPARE, the participants were taken into the dilemmas around data sharing. In another interactive session it was discussed how to shape the guidelines. It was concluded that added value of the guidelines can be found when they would build upon existing guidelines (i.e. Tripartite Zoonoses Guide) and focus on implementation. In addition, also contact has been made with the University of Minnesota to further discuss what can be learned from their OH-SMART programme and whether the the toolkit can be of use to us.

JIP2-WP2-T2: Development of structured decision making

This task has some similarities with objectives in ORION and in the EU project COMPARE and connections were made with both of these projects to identify synergies and complimentary activities. There were no specific

overlaps identified between the two projects, however the glossary of terms developed within ORION has potential to reduce some of the effort required in COHESIVE. As we are not able to wait until the glossary is completed by ORION, cross checking on progress is an ongoing task.

A single questionnaire was sent out to attendees of the workshop held in APHA 26/27th Nov. This included specific questions that were aimed at supporting the deliverables of this task. The questions gathered information and references to risk assessment tools that are currently in use by attendees. In addition to the inventory of existing tools a breakout session was held at the workshop to gather user stories on what the wider context of why they are being used and also information of how comfortable users are working with them.

A literature review of “one health rapid risk assessment” search results was conducted and previously reported (9 month Summary Progress Report). Combined with the results of the questionnaire this will become the content for the decision support tool to work with. As publication of risk assessments and risk assessment methodologies is a constant process, the work package will continue to allow new items to be added throughout the period of the project, however the formal information collection is now complete.

The next immediate task will be to produce a specification for the decision support tool, based on the workshop break out session results. This specification will guide development in how the tool should look and be navigated.

2.3. WP3.Towards an EU zoonoses structure

JIP2-WP3-T1: "Explore current ways for exchanging signals between countries and cross disciplines – pathway analysis"

Within this task is started with exploring current ways of exchanging signals between countries by contacting them directly. Also, some questions on this topic were included in the questionnaire mentioned under WP2 and were used as input for the inventory workshop in November. The continuing work within this task will build upon the results of the group discussions at the inventory workshop held at APHA in November 2018. During the interactive sessions of the workshop, information was gathered on ways of exchanging signals and on barriers and obstacles for sharing information. Examples on functioning pathways on exchanging information on signals were given, such as some EURL/NRL networks. Also, examples on agents with no networks or disciplines were given. Further work within this task will proceed with the information gathered during the workshop as well as from the questionnaire. Next step will be, together with the participants, provide a report on the current ways of exchanging signals cross disciplines and between countries. This report will illustrate these exchanges using examples of regulated and less regulated zoonoses.

JIP2-WP3-T2: Select tools for horizon scanning and signal detection

Horizon scanning is defined as a specific foresight methodology that utilizes various steps to identify issues at the edge of current thinking that may have significant impact in the medium to long-term future. Horizon scanning has been identified as a promising sense making tool prior to decision making. The multisectoral nature of horizon scanning provide opportunities for successful out-reach to disseminate key trends for one health applications. This task has started to get insight on how horizon scanning is designed to foster engagement between academics and policy makers. In order to achieve that, the work in this task started with a literature review concerning horizon scanning methods applied to One Health. Various horizon scanning methods have been identified and for instance, it turned out that there are different definitions in place. For the participants on the COHESIVE workshop at APHA in November 2018, a couple of questions on this topic were added to the questionnaire. The outcome of the questionnaire together with the information gathered via the performed literature review will be used for further steps in the task. Currently, various expert and analysis teams are being established and fostered in a collaborative culture to reach a holistic approach.

JIP2-WP3-T3: Retrospective systems analysis of detection of outbreaks

This task started in month 6 of the project. During the kick off meeting potential partners were identified as wanting to contribute to varying degrees depending on the level of data available within individual countries.

The immediate task involved selecting potential pathogens that could be used as case studies. As there was not one single pathogen that each country has experienced an incident with, a list of potential candidates was created. These pathogens were mostly focused on 'orphan zoonoses', defined as zoonoses for which no specific animal-health derived legislation exists. These present a challenge to One Health detection systems as they may not trigger formal intelligence gathering channels, but may still pose a threat to human health.

In order to structure the analysis in a way that all partners could participate (also with limited amount of time) while still producing outputs that are comparable between countries and maximizing the advantage of having several different points of view. For this various different systems analysis and operational research frameworks have been investigated, however no simple technical solution could be identified. Currently a bespoke systems analysis template is under preparation to guide individual countries in completing it to one of several geographical levels of resolution in an attempt to stratify the analysis to enable cross-country comparisons to be made in at least the highest stratification. This task will be performed in co-operation with task WP3-T1.

2.4. WP4: Data platform to facilitate risk-analysis and outbreak control

JIP2-WP4-T1: Molecular typing data and metadata – database creation

A new description of task 4.1 has been made with a more extensive explanation of the National Information Systems we are aiming to develop and their placement in the general picture. This new, more detailed description is incorporated in the Annual Workplan Year 2.

JIP2-WP4-T1-ST1: Workshop on data and DBs

- The WP4 workshop has been held at APHA-Weybridge on November 26 – 27, partly combined with the workshops for WP2 and WP3. In the meantime, for the purpose of this sub-task, teleconferences have been held with COMPARE and ORION projects and a meeting has been held with EFSA (April 2018). A further meeting has been conducted on June 26 with ECDC to harmonize our activities and outputs with the future EU Joint Database EFSA/ECDC. Harmonization with EFSA has been discussed through repeated telephone calls and a face-to-face meeting with EFSA officers. Refinement of Task 4.1 output is ongoing.
- During the workshop, the idea of the COHESIVE prototype Information System has been presented.
- Comments and suggestions have been raised during the workshop. In particular, ECDC representative has proposed to use the EFSA and ECDC coding system for metadata as well as the scheme of data access rights used by the Molecular Typing Data Collection. A representative of the COMPARE project suggested to have a new meeting COHESIVE-COMPARE in order to use COMPARE solutions in COHESIVE prototype Information System.
- To investigate the availability and implementation status of NGS methods for FBD surveillance and outbreak investigations, data gathered by ORION will be used. Moreover, the discussion during the roundtable highlighted the need to collect new information from COHESIVE partners with the aim of identifying examples of One Health surveillance systems as well as some details about the level of interoperability between different databases. So, a new Questionnaire has been prepared and sent to all EJP participants in the COHESIVE workshop of November 26-27.

JIP2-WP4-T1-ST2: Design and implementation of DBs

- So far, a preliminary logical Entity-Relationships diagram has been designed, taking into consideration comments from the EFSA side during the kick-off meeting. An architecture of foreseen interactions among the information systems and information flows has been developed and discussed during EFSA/ECDC meeting of June 26.

JIP2-WP4-T1-ST4: Analysis of the systems in involved countries

- Analysis of the systems in involved countries will be the next step. At current, a study of the systems in Italy is in progress.

JIP2-WP4-T2: Development of a platform-independent tracing framework

JIP2-WP4-T2-ST1: Evaluation of all available approaches, algorithms and tools for tracing, epidemiological analysis and visualization combined with WGS data.

- Additional to already known tracing tools found by an EFSA working group (DEMOS), a web search was

done to find software systems with tracing capabilities along complete feed or food supply chains. The tools found were evaluated according to their functionalities regarding food traceability like one step forward and one step backward, compliance with the EU regulation 18/2002 and its visualization and analyses features. The result is a web-based interactive table-like compilation that compares the functionalities of the software tools found and that will be published for the other project members together with a report about it in the first half of 2019.

- The subtask will not be finished at the end of this year. We elongated in agreement with the project coordination in order to be able to integrate even more available tools together with project partners, especially tools focusing on WGS are pending. We underestimated this part a bit and additionally put much effort on the other subtask, which is the development of the tracing platform, see below. No other task or subtask in this project depends on this work. Therefore the upcoming continual improvement of the tracing tool analysis will not affect the work on any other tasks or subtasks.

JIP2-WP4-T2-ST2: Programming a software and developing an algorithm

- Server for platform is designed and set up. A restricted area is designed and developed. A data model for data collection form and database are defined. First analyses and visualizations are realized and performance needs are identified.
- The overall status and progress of the whole project FoodChain-Lab can be inspected at <https://foodrisklabs.bfr.bund.de/foodchain-lab> .
- There are several pieces that at the end will come together within this platform. Planned are:
 - A data collection module
 - An interactive analysis module
 - A WGS-data integration module
 - A reporting module
 - A synchronization module with the desktop version of FoodChain-Lab
- A continuous deployment pipeline for the portal was established. New software versions are deployed automatically to a test server accessible at <https://fcl-portal-dev.bfr.berlin> where new features of the tool can be evaluated.
- To collect and exchange data in a standardized manner a data structure in a JSON format was developed. The data structure can store supply chain data that are gathered during foodborn outbreak investigations. The data collection mask providing immediate feedback to the data collectors about their data quality is under development.
- It is planned to have regular web conferences on a three month basis with project partners and further interested parties, e.g. EFSA.

JIP2-WP4-T3: Development of a platform-independent risk modeling framework

JIP2-WP4-T3-ST1: Requirement analysis

- Typical components have been identified that support quantitative microbiological risk assessment, advanced simulation techniques, documentation and extended usability. Selection of minimal models for testing and development is ongoing and will be completed in Q2 2019, as well as the prioritization of building blocks for implementation in web application of rrisk. Risk is an R-package and a prototype of a program that supports the risk assessor in the development and documentation of quantitative risk models. Currently, also the search of models and data suitable as case study (ideally with input from project partners) is ongoing

JIP2-WP4-T3-ST2 Implementation

- Various minimal models from the literature and from project partners were tested and defined. Risk questions and scenarios as well as quantitative risk models were provided by partners in COHESIVE and other EJP projects. As part of the implementation of standards, we were also provided with data sets and use-cases in cooperation with the FLI. Furthermore, in cooperation with project partners we have prioritized different building blocks. For the web application of rrisk we developed various mocks to define the workflow and the individual steps of the user interface in R shiny (this subtask will be finished in Q3 2019).

- In cooperation with EFSA and openanalytics¹, we want to work towards integrating risk (web-based version) into a European platform-independent framework for risk modelling.

¹ <https://www.openanalytics.eu/>

3. Progress of the research project: milestones and deliverables

3.1. Deliverables

JIP name	Project deliverable number	Deliverable name	Delivery date from AWP	Actual delivery date	If deliverable not submitted on time: Forecast delivery date	Comments
COHESIVE	D-JIP2-1.1	Kick-off meeting	3	3		Meeting in Amsterdam
COHESIVE	D-JIP2-1.2	Website/platform operational	6	Does not apply		As the website of the overarching One Health EJP seems to fulfil our needs we will not develop our own website
COHESIVE	D-JIP2-2.1	Inventory of tools for systematic risk-assessment via questionnaire	8	11		Initial questionnaire sent out by month 8, it took longer to allow respondents to return answers. The inventory will be an 'open' record that we can add to as more partners respond
COHESIVE	D-JIP2-2.2	Inventory and ambition workshop	12	11		Combined workshop of WP2, WP3 and WP4. A summary is placed on the OH EJP website
COHESIVE	D-JIP2-3.1	Inventory and ambition workshop	12	11		Combined workshop of WP2, WP3 and WP4. A summary is placed on the OH EJP website
COHESIVE	D-JIP2-3.3	Pathway analysis of exchanging signals	10		18	The pathway analysis of exchanging signals has been initiated but not finalised due to workload and person circumstances of key staff. This has been solved enabling finalisation of the deliverable in month 18
COHESIVE	D-JIP2-4.5	Report of available tools and algorithms and ranking of most valuable features	12		18	Tools focusing on WGS are not finished yet. The workload of this subtask was underestimated. No other task or subtask in this project depends on this work.
COHESIVE	D-JIP2-4.8	Report section about user requirements, relevant modelling modules and final specification for a modelling tool	10		18	Contact with EFSA and a private company as potential cooperation partners has been established. Identification of synergies is ongoing in 2019.

3.2. Milestones

JIP name	Milestone number	Milestone name	Delivery date from AWP	Achieved (Yes / No)	If not achieved: Forecast achievement date	Comments
COHESIVE	M-JIP2-1	Initial workshop	2	Yes		Decided to postpone the workshop so it could be held together with the workshops of WP2 and WP3. Held in November 2018. Summary is placed on the website of OH EJP
COHESIVE	M-JIP2-2	Website/platform operational	6	Does not apply		As the website of the overarching One Health EJP seems to fulfil our needs we will not develop our own website
COHESIVE	M-JIP2-3	Prioritization of requirements for risk modeling framework	6	Yes		Typical components have been identified that support quantitative microbiological risk assessment, advanced simulation techniques, documentation and extended usability.
COHESIVE	M-JIP2-4	Prioritization of most valuable features of available tracing tools	12	No	18	For tracing of supply chains this is sufficiently done. Tracing focusing on WGS is not yet complete, see Deliverable above. It will be finished within the first half of 2019. There is no critical dependency due to this delay

1.1.



4. Publications and patents

Not applicable

5. Impact & relevance

A major aim of this project is to close the gap between public health, food safety and veterinary domains, mainly in the area of risk-analysis. The aim of COHESIVE is to enhance collaboration on all zoonotic threats, irrespective of the regulatory status. Earlier warning of potential zoonotic threats in a structured and integrated way, will facilitate risk management, between the human, food and veterinary domains making use of the tools to be developed in this project (implementation guideline for integrated risk-analysis, decision-tree help selecting the proper risk assessment tool). In the workshop held at APHA in November, important steps were made to develop the foreseen tools, including attracting people to participate. In addition, the workshop was a good opportunity for networking over domains but also over countries. Also, people were informed on the goals of the project, the importance of hum-vet collaboration, but they also had the ability to share and discuss i.e. barriers of collaboration and learn from that. Currently, co-operation and collaboration on cross-bordering threats functions better on regulated than on non-regulated diseases. Collaboration with EFSA, ECDC and EU-Commission in this respect is crucial. In this first year, contacts have been made with the EU-commission, EFSA and ECDC. With EFSA and ECDC, also general agreements were made on further involvement of both organisations, although they have to be further refined. The integration of One-Health surveillance systems with pathogen WGS data will further close the gap between Med and Vet. In this first year, several meetings were organized, including the November workshop, in which was discussed how to work together and get a functional One-Health surveillance system. Also, information about the actual situation on surveillance systems which differs between countries and domains was exchanged. The evaluation of the status of tracing tools and the development of a tracing platform applicable for administrations in EU are one of the urgently necessary and overdue steps for pushing forward digitalization of One Health needs within the EU. Within the different meetings new contacts were made with people from other domains and expertise, bringing the related tasks to a more One Health approach.

6. Follow-up of the recommendations and comments in previous review(s) by the Ethics Advisors

Requirements (from ethical reviewers)	Measures and actions taken
Not applicable	

7. List of critical risks

Description of risk	Yes/No
Loss of key-persons (staff and / or leaders)	Yes
Delay in work plan execution	Yes
Conflicts within the consortium	No
Lack of commitment of partners	Yes
Delay in duties, tasks or reporting	Yes
Poor intra-project (JRP) relationship	No
Potential entry/exit of partners	No
Other risks (please describe)	Yes



Additional information:

- At APHA there might be some risk with respect to recruitment and succession planning
- There is some delay in the work plan execution, which will lead to not making all deliverables in time. However, up to this point, this does not seem to lead to problems in the final results/products.
- It appears to be very difficult to engage people with the right expertise into WP2 and WP3. The workshop of November has provided new contacts and hopefully will solve this problem.
- Partners and key persons loaded with other tasks. In addition, unforeseen crises and outbreaks in partnering countries may lead to delays in achieving the milestones.
- Challenge to get countries involved in the STMs in year 3
- Concerning WP4 we anticipate the possibility of "political" problems, such as a very strict interpretation of the GDPR by some institutions or countries, making difficult a proper connection between WGS data and some metadata crucial for the epidemiological analyses.

Most likely, some of the risks emphasized above will be corrected during 2019, according to the progress of the project. However, a contingency plan is anticipated to prepare for mainly with respect to the involvement of countries in the STMs in year 3, and the problems around a very strict interpretation of the GDPR by some institutions or countries.

8. Interactions with other JRPs/JIPs or with external (EU or national) relevant project

- Contacts with EFSA and ECDC: telephone calls, meeting at ECDC, EFSA present at kick-off meeting, ECDC present at workshop at APHA, ECDC and EFSA gave presentation during that workshop (EFSA via skype connection)
- Cogwheel meeting with COMPARE
- OH EJP JIP ORION: people from ORION present at kick-off meeting and workshop, several COHESIVE members present at kick-off of ORION, several people involved in both COHESIVE and ORION.
- EJP JRP NOVA: people from COHESIVE present at kick-off meeting of NOVA and vice versa
- EU representative present at kick-off meeting

9. List of dissemination and communication activities

Name of the activity:	<i>Workshop Cohesive</i>		
Date:	<i>November 26-27</i>		
Place:	<i>APHA, New Haw, England</i>		
Specify the Dissemination and Communication activities linked to the One Health EJP project for each of the following categories			
	<i>Yes / No</i>		<i>Yes / No</i>
<i>Organisation of a Conference</i>	<i>No</i>	<i>Participation to a Conference</i>	<i>No</i>
<i>Organisation of a Workshop</i>	<i>Yes</i>	<i>Participation to a Workshop</i>	<i>No</i>
<i>Press release</i>	<i>No</i>	<i>Participation to an Event other than a Conference or a Workshop</i>	<i>No</i>
<i>Non-scientific and non-peer-reviewed publication (popularised publication)</i>	<i>No</i>	<i>Video/Film</i>	<i>No</i>
<i>Exhibition</i>	<i>No</i>	<i>Brokerage Event</i>	<i>No</i>
<i>Flyer</i>	<i>Yes</i>	<i>Pitch Event</i>	<i>No</i>
<i>Training</i>	<i>No</i>	<i>Trade Fair</i>	<i>No</i>
<i>Social Media</i>	<i>Yes</i>	<i>Participation in activities organized jointly with other H2020 projects</i>	<i>No</i>
<i>Website</i>	<i>Yes</i>	<i>Other</i>	<i>No</i>
<i>Communication Campaign (e.g. Radio, TV)</i>	<i>No</i>		
Specify the estimated number of persons reached, in the context of this dissemination and communication activity), in each of the following categories			
	<i>Number</i>		<i>Number</i>
<i>Scientific Community (Higher Education, Research)</i>	<i>~50</i>	<i>Media</i>	<i>0</i>



<i>Industry</i>	<i>0</i>	<i>Investors</i>	<i>0</i>
<i>Civil Society</i>	<i>0</i>	<i>Customers</i>	<i>0</i>
<i>General Public</i>	<i>0</i>	<i>Other</i>	<i>~5</i>
<i>Policy Makers</i>	<i>0</i>		

10. List of planned tele- or video conferences, face to face meetings in the next year

List of planned tele- or video conferences, face to face meetings. WP4 leaders may contact project leaders and participate

Every 6 weeks a teleconference is planned for the steering group. The annual meeting for all members of the project will be scheduled for Spring 2019. In Autumn, a workshop will be organized. Regular teleconferences will be organized with ECDC/EFSA with project coordinator or steering group. Frequency not yet determined.