Thesis

Role of research funders in creating impact from research projects

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Abstract

Introduction - Creating impact has been an important aspect in many research projects, as it reveals the return on investment in research to society. Especially in antibiotics resistance (ABR) research projects which aim to improve the health population worldwide. It is concerning that ABR has become an established reality, therefore creating impact in these projects is of uttermost importance. An important aspect in creating impact is implementing the results into practice and the involvement of actors, in particular the research funder. The role and responsibility of the research funder in creating impact of research projects has not been widely reported. Moreover, the research projects have a short-term duration which might not be beneficial in a continuous process of creating impact. Therefore, the aim of this research is to gain insight into the role of the funder in creating the research impact of completed research projects. In addition, the focus is on how impact expands beyond these research projects.

Theoretical framework - In order to investigate this, there is focused on one research funder as a case study, the Dutch organization for health research and development (ZonMw). Within ZonMw, the creation of impact is prominent in the "rational pharmacotherapy" (GGG) program. The creation of impact from health research is defined as a noticeable change in evidence-based practice. This study is guided by the concepts of health research impact. Further, there is elucidated on how health research impact can be assessed and how different concepts are related to this. A framework together with ZonMw's framework surrounding creating impact is illustrated and used as a guideline for the analysis of this research. As of last, a more detailed explanation is given of projectification.

Research method - This research conducted a qualitative case study in which relevant documents in the process of creating impact throughout the project were analyzed. Further, interviews with key actors in this process were performed to map out the perception of the roles and responsibilities.

Results - The results of this study presented few different roles the funder can take on. Before the project is granted, the funder can create conditions for implementation through legislation in implementation. This forces and stimulate the project group to already think about creating impact before the start of the project. During the project, the role of the funder is encouraging, motivating, and stimulating the project group to create impact. After the completed project, the funder can influence the process of impact beyond the project. A key role in this is the monitoring of implementation results. However, the capacity to monitor and support the creation of impact is considered challenging according to the research funder.

Discussion & conclusion - As expected, there are significant bottlenecks within the funder and project group in effectively creating impact including a lack of resources and expertise. However, a core finding is that many of the bottlenecks for change relate to the science culture within the project groups and at the funder level. Accordingly, the switch has to be made from a culture of publication pressure to actually creating impact and changing patients' lives with the generated research results. Further, the responsibility to implement the results has been assigned to professional associations. Nonetheless, the funder and project group can take upon a pro-active approach to take the first step in implementing the results. The research funder is willing to take this responsibility in creating impact beyond a research project.

Abbreviations

ABR	Antibiotic resistance
AMR	Antimicrobial resistance
GGG	Rational pharmacotherapy
DO	Program efficiency studies
SWAB	Dutch Working Party on Antibiotic Policy
STIP	Stimulate Application In Practice
VIMP	Dissemination and implementation impulse
ZIAF	ZonMw Impact Assessment Framework
ZonMw	Netherlands Organisation for Health Research and Development

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Keywords

Impact, implementation, antibiotic resistance, funder, projectification

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Chapter 1: Introduction

It is widely accepted that research can lead to improved health outcomes (McLean, Graham, Tetroe, & Volmink, 2018). In order to achieve this improvement, it is necessary that impact is generated from that specific research. An important aspect in creating impact is the implementation of results. Implementation is the process of introducing research output into healthcare to improve patient care. These outputs may include clinical research results i.e. study results that involve the human species in developing and testing new treatments that aim to improve patient health care (Brantnell et al., 2015). However, translating the results of research knowledge into action can be challenging. The challenge reveals significant gaps between what is known about improving patients' and/or global health, and what is eventually done to improve this health (Tetroe et al., 2008). Therefore, translating research into meaningful impact requires more than presenting the results in the scientific field and waiting for a party to use those results in daily practice. This is the traditional thinking of the scientific research culture, while impact on patients' lives requires actions that stretch well beyond this thinking (Neylon, 2017). Creating impact involves knowing what to do with health-related knowledge – how to access it, appraise it, tailor it for a specific context, apply it in the practical world, and know when it is not appropriate for practical application (Neylon, 2017). That is an entirely different challenge than just generating results, which most researchers are familiar with. When this challenge is accomplished, a noticeable change in healthcare practice and/or other evidence-based practices should be seen (Penfield et al., 2014; Baker, Scoble, & Wykes, 2014). In this research, there will be referred to this as the creation of health research impact. Ultimately, the goal is to improve patients' health by making progress in the quality and effectiveness of healthcare.

In recent years, there has been increasing focus on promoting the impact of ongoing and completed research projects (Packendorff & Lindgren, 2014). It is often said that research impact from projects can be increased by improving the interactions between research, decision-makers, and practitioners (Brantnell, Baraldi, van Achterberg, & Winblad, 2015). The role that research funders play in this process is, however, more opaque. Lately, research funding agencies have responded more to the poor creation of impact. In fact, research funders have financed another charge for unlocking the power of knowledge, by increasing their focus on the creation of impact (McLean et al., 2018). Previously, research funders were not considered as such an important role compared to researchers, patients, governments, health insurers or universities (Dalziel M, Roswell J, Tahmina TN 2012). Likewise, funders rarely engaged in the business of research implementation, although they are one of the many actors in creating impact (McLean,et al., 2018; Dalziel M, Roswell J, Tahmina TN 2012). This research argues that the role of the research funder in creating impact is particularly relevant. Funders control access to resources and their influence can exert on other actors in research systems—requiring certain policies or practices to be adopted as a condition of funding—and therefore have a dominant position (Curry et al., 2020). This position can be used as an incentive for action from the research community, including researchers, research users, and professional associations (McLean et al., 2018).

Understanding precisely how the funder creates impact with project leaders of the research projects is a crucial step in knowing the research funders' role. In this research, the role of the funder is examined with the Dutch organization for health research and development (ZonMw) as a case study. ZonMw is a funder of health research in the Netherlands, who values knowledge creation and improving the quality and effectiveness of healthcare with their funded projects (ZonMw, 2020). For example, by participating in the *"Ensuring Value In Research"* (EViR) funders forum where different funders around the world can engage about creating impact (ZonMw, 2020). Also, the policy plan (2020-2024)

included stimulation of impact as one of the three core tasks of ZonMw. An increasing focus of this vision on creating impact has been applied in the *"rational pharmacotherapy"* (GGG) program.

In particular, the antibiotic resistance (ABR) projects within GGG are relevant due to the fact that resources invested in these research projects are not matching with the expected impact ("Evaluatieonderzoek programma ABR," 2019). The focus on ABR projects increased after the World Health Organisation signalled an emerging resistance to antibiotics in 2015. ABR is one of the greatest threats to global health according to the World Health Organisation (WHO, 2015). The European Centre for Disease Prevention and Control (ECDC) acknowledged antibiotic resistance as one of the major threats related to infectious diseases, together with nosocomial infections, HIV, and influenza (ECDC, 2008). Resistant bacteria can be found in any substance: in animals, healthcare, food, environment, innovation and internationally (WHO, 2015). The Dutch government implemented a National Antibiotic Resistance program, which ran from 2015 to 2019, which included an integrated approach (One Health) ("Evaluatieonderzoek programma ABR," 2019). ABR is still a prominent problem, it has become an established reality in health care and has begun to spread in nursing homes and the community (ECDC, 2008). Therefore, having an impact in these type of research projects, seems to be of greater importance. Likewise, the incorporation of the project findings into health policy and routine clinical practice has often not taken place, thereby reducing the return on investment in research to society (Tetroe et al., 2008). Importantly, there is evidence that the impact creation process is of a slow and inconsistent matter (Penfield et al., 2013, Baker, Scoble, & Wykes, 2014; Mclean et al., 2018).

The type of ABR projects mentioned above are mostly short-term, they take an average of around 5 years (ZonMw, 2020). A concern is whether the temporary nature of these ABR projects will be able to contribute to a culture where research impact is a long ongoing process. In addition, not knowing exactly what the role of the funder is in this process does not benefit the process. The emergence of third-party funded projects, which is often identified as "projectification", through exclusive organizations of research is implemented to ensure a competitive distribution of financial resources to the research system (Felt, 2017; Bal, 2017). Knowledge production must be gathered within a limited time span and publications are required to demonstrate the worth of the investment (Bal, 2017). If the project team manages to answer all the relevant questions and provide results within the given timeframe, it may cause researchers to diminish the long-term goals or become less important for decision-making and implementation since the project has been completed (Felt, 2017). Thus, it is important to examine whether projectification is beneficial for creating impact in ABR projects.

Accordingly, in this study, the role of the funder in creating and shaping impact from the results of projects and during projects is investigated. These findings can help to ensure that the investments generate the greatest return for people and society (Mclean et al., 2018; Sampat BN, Lichtenberg F, 2011). The primary intended users of this study are health research funders. They can use the findings to facilitate implementation in various ways, idem for funders who allocate resources to clinical research to improve public health (Brantnell et al., 2015). Secondary users of this work will include health and science policy-makers, as well as researchers interested in this topic. The healthcare providers could use this knowledge in planning and executing the implementation of projects. Besides, the outcomes could contribute to how the funder may become more active in the gap between research results and impact. For example, funders can engage early on with the researchers and related stakeholders to understand their concerns and work harder to define the benefits more explicitly to all stakeholders (Froude, 2012).

Concluding, the role of the funder in creating the impact of research has not been widely reported. Particularly in research that takes place in the form of a project. The aim of this research is to gain insight into the role of the funder in creating research impact from completed research projects. In addition, the focus is on how impact exceeds these research projects. Hereby focussing on one funder as a case, which is ZonMw. Therefore, the following main question will be researched in this paper:

What is the role of funders, in this case ZonMw, in the creation of impact in completed ABR research projects of rational pharmacotherapy?

The sub-questions which are part of answering the main question are linked to the timeline of the projects: before, during, and after the projects. The sub-questions are as follows:

- Before: *To what extent is impact discussed on program level?*
- During: *What have project teams done to ensure impact during the course of the projects (project level) and how did the funder steer in this matter?*
- After: *After the project, did the funder actively engaged in how the project teams undertake in creating (long term) impact?*

1.1 Chapter overview

This paper will answer these research questions in the following chapters. First, several definitions and concepts are elaborated in the theoretical framework. This chapter also elucidates a conceptual model upon which the research and analysis are guided. Hereafter, the methodology for the case study research is explained. It includes the case description and selection criteria. Further, the most interesting and important findings are presented and linked to the theoretical framework in the results section. In the last chapter, the results are discussed and compared to other relevant scientific literature. In addition, implications for further research are given. Finally, a conclusion is provided about the role of the funder in creating impact of completed ABR research projects of rational pharmacotherapy.

Chapter 2: Theoretical framework

The following chapter explains why the focus of this paper is on research funders and what health research impact means. Further, there will be elucidated on how health research impact can be assessed and how different concepts are related to this. A framework together with ZonMw's framework surrounding creating impact will be illustrated and used as a guideline for the analysis of this research. As last, a more detailed explanation is given of projectification.

2.1 Focus on research funders

Research funders are rarely engaged in the business of research implementation (Dalziel M, Roswell J, Tahmina TN 2012). However, in this study, it is argued that the role of the research funder in creating impact is particularly relevant. Funders control access to resources and therefore have a dominant position. Evidence has shown that funders who are contributing to impact have more potential on creating impact compared to funders who did not (Sampat BN, Lichtenberg F, 2011; Dalziel M, Roswell J, Tahmina TN 2012). Moreover, the funder has more freedom and choice to experiment and drive change than many of the other actors in research systems (Hackett, 1990). Although these papers show how funders are involved in creating impact, not much is about known how the funder can influence the project group after the project has completed.

2.2 Health research impact

There might be assumed that the term *"impact"* is a universally well-defined and comprehensive concept. However, several definitions and types of impact are mentioned in the literature. Therefore, defining impact for this research is necessary. According to a research paper on impact developed by the Overseas Development Institute, impact is defined by private foundations as 'impact investing', academics outline 'research impact' and social change actors describe 'collective impact' and 'social impact' (Hearn & Buffardi, 2016). A general dictionary definition is given:

"Positive impact is defined as a "turning the curve" (or beating the data baseline) on a community indicator of wellbeing or a program performance metric that answers "are our customers/clients actually better off as a result of our efforts?" - ("What is Impact and How do we Measure it? - Clear Impact," 2011.)

In this research, and following T. Penfield et al. (2013), health research impact is defined as a noticeable change in healthcare practice and other evidence-based practices to improve the quality and effectiveness of health care. For simplicity, health research impact will be referred to as research impact or impact in the following chapters.

One of the key elements in creating impact would be actions that align with the stated goals and measure success against those same goals (Hearn & Buffardi, 2016). In practice, most impact creations require actions more aligned with the infrastructure discourse and reporting requirements. Where reporting requirements are stronger, they rarely provide data that would support assessment of progress towards the goals (Hearn & Buffardi, 2016; Hacket, 1990). So, the occurrence of poor data reporting along the process will be taken into account when accessing the creation of impact.

2.2.1 Assessing impact

Impact is phenomenon which has been hard to 'measure' over time (Heath et al., 2011). Still funders, organization executives and/or individual investors are demanding proof of impact (Krieger et al., 2003). They want to know whether their time, money and efforts are making a difference. A research paper by Baker et al, 2010 supported this by saying:

"We all want to have a positive impact, but impact can go both ways. It's unfortunate (but extremely important) to understand that our work may have a negative impact or no impact at all. This is why impact measurement is so important. It helps us clearly see the effects of our strategies so that we can reinforce what is working and change (or eliminate) what is not."

There are many framework to asses impact, a widely known one is the Health Impact Assessment framework (HIA) (Krieger et al., 2003; "What is Health Impact Assessment? | RIVM," 2011). In the HIA framework, the term impact is only explained and applied in decision-making and implementation (Harris-Roxas & Harris, 2013). In addition, this framework does not include impact to be a part of a logical path in achieving long-term goals. Therefore, this framework is not preferred compared to the following framework.

The definition of impact given above is based on the criteria of the framework provided by Kuruvilla et al. (2006). There are four broad areas included in the so-called "Research Impact Framework" (RIF). First, research-related impacts are impacts within the research field itself. Second, policy impacts are the influence and information provided to policy. Third, the change in both health and intersectoral services are included in service impacts. Lastly, the effect on the societal level is captured with societal impacts (Kuruvilla et al., 2006). The framework is understood as a tool to influence the decision-making, implementation, and other related activities rather than direct changing health outcomes (Harris-Roxas & Harris, 2013; Kuruvilla et al., 2006). This means the framework can be applied in both academic outputs as well as wider societal benefits to assess the results of health science research. As there is a fine line between the distinction of direct and indirect impact, both were taken into consideration when assessing impact.

2.2.2 ZonMw Impact Assessment Framework (ZIAF)

In order to understand how the funder interprets "impact" and how they currently try to create impact, their definition of impact and framework for assessing impact is explained. At ZonMw, there is impact when there is knowledge production and utilization. These concepts are defined as the creation of useful knowledge by projects in the fields of practice, policy, education, and/or research. As a funder, they find it their responsibility and task to create impact to a certain limit. Their concept of impact is further elaborated in their ZonMw Impact Assessment Framework (ZIAF) (ZonMw, 2020). The core elements of ZIAF are Promoting Responsible Research Practices (A), Productive Interactions (B), and Impact Pathway (C) (ZonMw, 2020). This system is developed to determine the value and make it possible to indicate the impact or stimulation of impact in health research and care innovation in primary assessment and evaluation processes (ZonMw, 2020). In addition, it offers tools for pattern recognition and (scientific) reflection on the operation and effectiveness of ZonMw policy which aims at realizing impact in terms of the social use of knowledge (ZonMw, 2020).

Although these frameworks provide a great tool to access impact, the frameworks focusses on "knowledge products". While in order to know how impact reaches beyond a project, it is important to know how these products contribute in the several areas mentioned above. Therefore, the ZIAF together with the framework of Kuruvilla et al., (2006) will be implemented in Contribution Mapping, which will be explained in the next sub chapter, to support data analysis. It provided guidance for evaluating the role of the funder in creating impact from project results.

2.2.3 Knowledge utilization

As mentioned above, knowledge utilization is used for describing impact at ZonMw and RIF. The term knowledge utilization in research tends to refer to any activity that is concerned with improving

the use of knowledge (Graham et al., 2006). Hereby the knowledge has a research base to substantiate it (Graham et al., 2006). Moreover, it would enable the funder to better develop their own knowledge utilization strategy for funding implementation research (Harris-Roxas & Harris, 2013). The focus of knowledge utilization is on the application or uptake of the knowledge. While in this research, it is also important how impact is created throughout a research.

2.3 Contribution Mapping

In this research, a constructive approach is used to monitor and evaluate effects. This approach is called Contribution Mapping by Kok & Schuit, 2012 and Borst et al., (2019), the following information is based on this paper. It is intended to assess contributions and processes rather than impact products. Previous studies' efforts to assess the 'impact' of research were struggling with operationalizing impact (Penfield et al., 2013; Kok & Schuit 2021). In addition, the identification of users in research have been a bottleneck in research projects. Contribution Mapping focuses on a three-phase model by processes and linked actors in the present, but even more important in the future by actor-scenarios. Additionally, it systematically assesses anticipatory efforts which aim at increasing contributions, the so-called alignment efforts (Kok & Schuit, 2012). Further, it is embedded in a change-oriented vision of research in the interaction process between the knowledge maker (e.g. researchers) and knowledge users (e.g. general practitioners, surgeons, etc.). Typically, the intended impact, in terms of the use of the results, determines the design and organization of the research. How research contributes to societal impact can therefore be regarded as a multi-perspective process of meaning-making, in which monitoring and action for the benefit of health alternate (Sibbald et al., 2014). Importantly, the shift is made from impact or knowledge products to contributions.

The choice of Contribution Mapping is based on the fact that the approach is designed to be useful for both accountability purposes and to help better leverage research to contribute to better health actions (Kok & Schuit, 2012; Borst et al., 2019). The accountability goals are defined as showing impact to external funders, rather than learning how to better deploy research and make useful contributions. Production of these maps is not the goal itself, instead it is used to compare the scenarios of the different outcomes. The contribution map created for the document analysis is displayed in appendix III. Various concepts which are relevant to Contribution Mapping are explained in the following sections.

2.3.1 Contribution to action

Kok and Schuit (2012) introduced the concept of contribution to action: *"Contribution to action refers to the activities which turn novel combination of knowledge into a 'going concern'.* The eventual action is likely to be a part of practices, successful innovations or become an element in implementation decision making. In most cases, researchers and linked actors turn a contribution into action by utilizing the new pieces of knowledge.

2.3.2 The three-phase process model

The first phase is the **formulation phase**. In this phase the activities are generally oriented towards directing search processes and mobilizing resources, and the formulation, selection and funding of specific research projects (Kok & Schuit, 2012). When applied to the selection of documents of the research projects, the formulation phase includes everything that is documented for the grant submission. As it is based on promises, expectations and negotiations, dominant ideas emerge about possible research directions and priorities (Hegger et al., 2014). Efforts will be made to attempt

aligning research and action with established research agendas, research commissioning or explicit prioritization in health professionals and patients. Further, researchers might involve potential users in formulating research proposals based on the anticipating perceived needs. The delineation from the formulation phase to the next phase happens when the research project is being funded by the research funder.

The next phase is the **production phase**, in which activities are performed to realize the knowledge products or contributions (Kok & Schuit, 2012). These contributions are divided in three categories: scientific, direct or other contributions. Scientific contributions include all products an activities aiming at creating research awareness. For example, conferences and/or articles aimed at people with a scientific background. Direct contributions include activities like training staff, adapting organizational practices, acquiring equipment, establishing relations with policymakers, recruiting participants, etc. according to Kok & Schuit, 2012. These contributions are divided based on the end-users in the field of researchers, policy, education and healthcare practice. Other contributions involves an array of activities which do not apply to the categories mentioned above. The delineation of products and activities is presented in appendix I. Ideally, during the production phase, there might already be some dissemination and/or uptake of emerging knowledges. The investigators and others involved may learn additional knowledge during the research project (Hegger et al., 2014). The new knowledge may become part of the knowledge they already have (Borst et al., 2019; Hegger et al., 2014). The moment the project has finished, the knowledge extension phase starts.

The last phase is the **knowledge extension phase**, the activities are aiming to make knowledge available to potential users (Kok & Schuit, 2012). The extension phase commences with dissemination and utilization in evolving actor-scenarios (Hegger et al., 2014). The linked actors, such as the investigators, might disseminate the research results through knowledge products and/or activities to initiate and stimulate utilization. The difference between the last phase and the production phase is that contributions are purely focused on what contributions are 'made' after a finished project. An example is given by Kok & Schuit, 2012: *"how through presentations, targeted dissemination and publications in popular media and scientific journals, the new knowledge may be added to diffuse and more explicit reservoirs of knowledge."*

2.3.3 Linked actors

The key actors are mainly the investigators or in this case the project leaders, as they are mostly involved in the project. Linked actors can be actors who are involved or are engaging with the research project The focus is on actors who are directly or indirectly involved with the research projects. If the proposal is discussed with potential users, then these are added to the process map as linked actors (Hegger et al., 2014). The role of influence of these individuals is examined to determine whether they are potential key users. Further examples of linked actors are research assistants, health workers, participants and policy makers (Glasner, 1996). Even the funder consist of linked actors such as staff members from ZonMw who manages the GGG program. Through these actors produced knowledge could be utilized. An advantage of focusing on linked actors in combination with alignment efforts is that it draws attention to what researchers and others can do to increase the realization of useful contributions (Kok & Schuit, 2012; Borst et al., 2019). This is crucial in a learning and use-based assessment approach.

2.3.4 Actor-scenarios

In "actor-scenario" mapping, key actors are asked to outline how research results potentially can be used and by who (R. Borst & Boaz, 2019). This describes how actors envision their own, but especially the roles of other linked actors. The responsibilities in creating impact after the completed project are an important theme in these actor-scenarios. An example is given by Borst et al 2019*: "these findings mean this organization should be doing this, those professionals should be doing this, these drugs should be doing this, and the funder is responsible for that, etc"*. This includes sharing knowledge, which can also be done through non-scientific actors, such as a friend who is interested in your article through social interaction.

Since there is assumed that these actor-scenarios about the future are conceptualized constantly by actors (Hegger et al., 2014). The focus is on who the actors assign roles to and what the actors' needs. Therefore, these actors will have differences between them due to their opinion, norms and values. It may also occur that actors assign roles and responsibilities in creating impact for themselves. Likewise, by pursuing the assigned roles and responsibilities mentioned in the actor-scenarios, they aim to accomplish a change (Neylon, 2017)

Another paper by Kok (2016) added to this "*Knowledge can be brought into such an 'actor scenario' to establish, support or reinforce it or to introduce new elements. Knowledge can also be used to undermine the actor scenarios of others. For example, these findings show that they should stop funding because those policies don't work. When users bring research results into such a scenario, these results are combined with existing knowledge and there is formulated what that knowledge means for a specific purpose in a specific situation."* Thus, the actor-scenario perspective recognizes that research results have no fixed meaning that is somehow imposed on users. While research results may play a role, the papers recognize that such outcomes may be assigned different meanings by different actors in different situations (Hegger et al., 2014; Kok et al., 2016). Regardless of the role that knowledge plays, its use can always be analysed in terms of evolving and interacting actor scenarios and attempts to realize them (Kok & Schuit, 2012; Borst et al., 2019).

2.3.5 Alignment efforts

Alignment efforts are defined as: *"deliberate efforts aimed to increase the likelihood that a contribution to action is realized"* (Kok & Schuit, 2012). Alignment emphasizes that accommodation can be on the research side and/or on the action side, rather than a one-way street from research to action (Kok et al., 2016). Some examples of alignment efforts include involving policymakers in setting research priorities, writing dissemination plan, and involving patients in the interpretation of results (Hegger et al., 2014). Such efforts encourage those involved in a research and action trajectory (e.g., researchers, policy makers, end users) to anticipate and make adjustments that increase the likelihood that contributions to action will be realized (Borst et al., 2019; Hegger et al., 2014; Kok & Schuit, 2012). In this research, assessing both alignment efforts and contributions to action for each research project will results in to which extent the alignment efforts are related to specific contributions. Such as involving policymakers in the formulation of proposals can increase the likelihood of research being used in policy making.

2.4 Projectification

The use of projects for tackling complex tasks or creative renewal in scientific research through third-party funded projects are referred to as projectification (Felt, 2017; Packendorff & Lindgren, 2014). Projectification is perceived as a controllable way to avoid most of the bureaucratic problems within an organisation (Packendorff & Lindgren, 2014)

2.4.1 Research project

In this study, the term "project" were understood as a team that gathers data, based on the expertise they are assigned in order to write certain papers or provide certain results (Bal, 2017). The research projects are a task-specific and time-limited form of working. This includes not promising permanence, continuity, or commitment (Ylijoki, O. 2016). On the other side, the project format offers a quick validation of their work, access to financing their post-doc projects, and more an immediate short-term return on the investments for the funder.

2.4.2 Broad conceptualisation

Projectification can be classified as a narrow or broad conceptualisation of projectification in research projects. In this study, broad conceptualisation is according to Packendorff & Lindgren (2014): *"building on recent critical inquiry into individual experiences of project work and the analysis of projects as a central discursive theme in contemporary society".* Hereby, the research projects appear to be empirically limited in reflecting the processes whereby a phenomenon is constructed, developed, and institutionalised. The aim of broad conceptualisation is to identify how the projects include consequences for individuals, groups, and societies (Packendorff & Lindgren., 2014). Broad conceptualisations offer an improved understanding of explaining the persistence and substance of project-based work forms despite their problematic consequences.

2.4.3 Paradox

Research projects are strongly dependent on the expectations and fluctuating needs of the funders. However, the ever-changing funding market creates uncertainty in the continuity of the ongoing projects. This uncertainty of the research project is related to a time-wasting problem. Writing research applications takes a lot of energy and time, but is perceived as a waste of time as most applications will not succeed due to the tough competition. This creates a paradox: the project format intended to produce maximum efficacy creates, however, a waste of efficacy and time. In addition, wasted time ensures diminishing of meaning and motivation in completing the targets (Ylijoki, O. 2016).

2.5 Conclusion

Various definitions of impact can be found in the literature. This article uses T. Penfield's (2013) definition as it allows to focus on the impact of research on health. Impact is further explained as a contribution instead of a knowledge product. It is part of an continuous process where it is important to know the several actors linked to this process. These linked actors are mainly the researcher or in this case the project leaders, as they are most involved in the project. Another linked actor could be the research funder, because they control access to resources and therefore have a dominant position in ensuring change. The linked actors can assign roles and responsibilities in creating impact for future scenarios, the so-called actor-scenarios. In these scenarios, alignment efforts are mapped. Alignment

efforts are defined as deliberate efforts aimed at increasing the likelihood of a contribution to action being realized.

Finally, there is elaborated on how projectification can influence the creation of impact. Since research projects are task-specific and have a time-limited span. It is important to know how an ongoing process of creating impact relates to the short term form of working in projects. In addition, there will be looked at how the funder can possibly adjust the time-limit or grant a different form of projects.

Chapter 3: Research method

This study used a qualitative case-study design. This design is most appropriate when a broad phenomenon, in this case, the role of funders in creating impact from research projects, is investigated by looking at one funder "ZonMw" as a case (Rashid, Rashid, Warraich, Sabir, & Waseem, 2019). ZonMw will be referred to as the research funder in further chapters.

3.1 Case descriptions

Antibiotic resistance has become an established reality in health care and has begun to spread in nursing homes and the community. Therefore, to help manage antibacterial resistance, the Dutch organization for health research and development (ZonMw) focusses on funding ABR projects within GGG program. The focus of this program is on applied research within the projects rational pharmacotherapy ("Evaluatieonderzoek programma ABR," 2019). It aims at increasing the use of research by ensuring the relevance and led to more decrease of antibiotic use. Several professionals are invited to submit research proposal that fit the call text. At the end of each study, the researchers have to submit a detailed report which contains a policy brief and specific recommendations, which are disseminated to potential key users. The research program started in 2012 and funded over 79 research projects through five annual rounds of priority setting, proposal selection, funding and support ("Evaluatieonderzoek programma ABR," 2019).

ZonMw funds different types of projects in the rational pharmacotherapy program: development projects, applied research and implementations projects. Development projects develop interventions based on previously acquired or scientific knowledge. Applied research focusses on the effectiveness of the project in practice, to see if the product or activity actually works in daily healthcare. The purpose of implementation projects is to implement the actual result, knowledge or intervention in practice. The funding for implementation project is now provided by offering a "Verspreiding impuls" (VIMP) or "Stimuleren Toepassing In de Praktijk" (STIP).

3.2 Data collection

This study collects data by performing a document analysis and by conducting interviews. Contribution Mapping by Kok & Schuit, (2012) and Borst et al., (2019) was used as an guideline to systematically examined how nine completed projects evolved and how results were used to contribute to action. The criteria of the eight selected projects are mentioned below. The assessment of each case started with reading available documentation, such as research proposals, mid-term reviews and final reports, and making a timeline-based process map. An overview of all the assessed documents is attached in appendix II. The timeline was divided into three phases: (1) formulation phase, (2) knowledge production phase and (3) the knowledge extension phase (e.g. dissemination and utilization). From each phase, the main actors, activities and interactions were mapped.

3.2.1 Criteria selection

The chosen projects were selected according to the following criteria:

1. *Heterogeneity:* There is opted for an approach with the most variation in projects to have a result with as many inclusion as possible. Otherwise if the same projects were chosen then only one or two outcomes may form the main conclusion. Further, there is opted to include the discontinued projects. As it can be a good lesson for the funder on how to be more alert on whether the project can create impact and how they could have prevented the discontinuation.

a. There is a distinction between implementation and non-implementation projects. The implementation projects are instructive to take a closer look. However, implementation is already central, the objective is to look at how it is best to safeguard knowledge utilization in research projects where implementation is not central.

2. *Choosing between the finished or ongoing projects*: A choice has been made to look more at completed projects (80/20% ratio). In that sense, completed projects are more interesting to look at, because you can also follow after the project what else has taken place in terms of knowledge utilization. There is reasonably documented what happened during the project. While ongoing projects do not really have their impact process provoked. Still, it is interesting to see how the project groups might think about their scenario's.

3. *Outdated/No longer available data*: With completed projects it is good to bear in mind that a number of projects are really a bit older. The older the project, the less good the documentation is provided. Also, sometimes contacting the project manager may be more difficult as the contact details are outdated.

4. It is difficult to delineate solely on the theme of antibiotic resistance, because almost all projects also hope to indirectly contribute to less antibiotic resistance. Therefore, some projects might not be as much related to ABR as other projects.

	Development project	*Applied research*	*Implementation project*
Before project			
Call text: call round 1, 2, 3 or 4	2	6	1
Project idea (PI)	1	6	1
Recommendation on PI	2	6	1
Detailed application	2	6	1
Supplement detailed application	0	1	0
Rebuttal on reviewers comments	2	6	1
Letter of approval	2	6	1
During project			
Progress report	2	6	1
Extra progress report	1	2	1
Supplement progress report	0	1	0
Memo progress report	2	6	1
Final report	2	6	1
Final stop report	1	0	0
Memo final report	1	0	1
Feedback final report	0	1	0
Supplement final report	0	1	0

Table 1: an overview of the several documents during the phases within the types of project

3.3 Document analysis

A total of 9 projects were analysed, consisting of 89 documents. Table 1 shows the number of documents that were selected for each type project and the according phase. Appendix II provides a detailed list of these documents The documents were handed over under conditions of confidentiality and require secure, reliable treatment with these parties as well as with the data and results that were collected. The reports from the research projects were analysed with the guidance of sub-questions. The questions were based on the theoretical framework. A useful analysis is therefore to consider how, for any given creation of impact, the language reflects the discourse, the extent to which impact creation is discussed and whether the funder is tracking success against their own framing, in this case ZIAF. The projects were mostly scientific or evidence based-research and funded by ZonMw. The funder allowed access to their resources and network to contact details of project teams and stakeholders.

After each case was analysed separately, a cross-case analysis was conducted to identify patterns in the association between features of research processes and the impact of the research. Following, the interview questions were structured based on the information gathered from the document analysis in line with the theoretical framework. With this, the actions of actors that are involved in, or interact with, a research project and the most likely influential users amongst them are traced.

3.4 Interviews

To map how research and translation processes evolved and contributions to action were realized, a set of interviews supplementing the document analysis was conducted. There are two topic lists based on who the respondent will be for the interview. The two topic lists are displayed in appendix V of this paper. The topic list strived to map actor-scenario by asking the interviewees to think of who would play a role in a future setting. In the interviews, there was inquired how the process of formulating a study proposal went and how the creation of impact during the research was conducted. Especially how contributions were achieved and translated into action. The interviewees were encouraged to provide detailed descriptions about the processes and interactions. This approach allowed an exploration of topics that were not as aligned with the concept of actor-scenarios. Further, emerging elaborated translations, claims and contributions to action were triangulated with the subsequent interviewee.

The interviews were conducted with the respondents and used as primary data. The interviews were held via Zoom or in person, based on the preference of the respondent. If the interviews were held via Zoom, the condition would be to have it with camera on. The reason why an interview with camera or an in-person interview is preferred because possible changes in the respondents' behaviour could be observed when asking questions. This is important due to the fact that the project leaders might be still dependent on the funder, which may cause the respondents to act differently. This have been taken into account when analysing the data. The method for the interviews were semi-structured. This is a suitable method as it allowed alterations during the interview based on the respondents' answers and the flow of the discussion. This method is also highly recommended when developing new insights (Newcomer, Hatry & Wholey, 2015).

3.4.1 Choice of interviewees

The choice of the respondents was based on who were and are mostly involved in the process of impact within the research projects. An overview of all the interviewees is given in appendix IV. The

purposively selected key informants consisted of (1) the project leaders of the finished responsible use of antibiotic projects and (2) staff members of ZonMw who are involved in the implementation of projects. All the interviewed project leaders were also the main applicant of their project. The network of ZonMw will be used to contact the project leaders. The project leaders are internist-infectiologist (I4), hospital pharmacists (I2; I3) and trauma surgeon (I1) in hospitals Amsterdam UMC, Haaglanden Medical Centre and Gelre Hospitals respectively. Further, the staff members of the research funder were implementation specialists (I7; I9), program manager (I6), head cluster of rational pharmacotherapy (I8) and member of strategy and innovation team (I10).

A total of 10 semi-structured interviews were conducted of which five were project leaders and five were ZonMw staff members. The final number of interviews was determined through data saturation (Fusch & Ness, 2015). This means that no new interviewees was included once no new findings emerged. All interviews were audio recorded and explicit notes were made during interview.

3.5 Data analysis

Subsequently, all interviews were transcribed in order for the data preparation. The interviews were organised and an initial read through was performed to gain general sense of the data. Data analysis was performed in first a qualitative within-case analysis and second a cross-case analysis. Within each case the features of research and translation processes were identified. This developed a set of open codes which were used in Atlas.ti. Open codes were applied by identifying critical segments and assigning code labels. An example of codes are ‘responsibility: who should implement results’ and ‘relationship funder and project leader’. These codes text were used as themes as well as description of data.

The final coding was derived from an iterative thematic analysis. This is the most appropriate method, because it allows to iteratively move back and forth between data and theory according to Timmermans & Tavory, 2012. The approach focuses on theory formation based on existing sociological theories and through systematic methodological analysis (Timmermans & Tavory, 2012). Following, using cross-case synthesis potential similarities or differences between the respondents were found (Yin, 2018). After finding the potential similarities or differences, abductive reasoning was used to provide propositions including envisioned roles and responsibilities. Lastly, the established propositions ensured the foundation for the conclusion.

3.6 Limitations, threats, validity & reliability

A limitation of this study was the limited data resources because the data can only be provided by the funder to a certain extent. In addition, in-person interviews are difficult to perform due to the Covid-19 pandemic. Besides, a relatively short research period may make it difficult to achieve more in-depth research. Hereby, efficiency in time planning was the key to having less time-consuming research in order to provide a detailed single-case study.

A possible threat to this research might have been the funder causing a bias in data collection and analysis. This bias could be seen in the documentation of current projects who are still relying on their funder. Therefore, differences may appear compared to project leaders' answers who already completed projects and thus are independent. Furthermore, the funder may influence the analysis as they want this research to be beneficial for them. However, as an independent researcher, being objective is one of my main priorities. Thereby, a second researcher will be observing the analysis which leads to an increase of impartiality. Further, as with all retrospective studies, the reporting of information (eg, impact during project) was subject to recall bias and misclassification.

The validity of this research has been obtained by providing a well-documented audit trail of materials and processes (Yin, 2018). This was achieved through being precise and accurate when transcribing the interviews and analysing the data. Furthermore, the so-called ‘’member check’’ has been included to increase the validity (Mays & Pope, 2000). After an interview and analysis of data, the results were discussed with the respondents in order to know whether the answers were interpreted correctly. Moreover, triangulation methods have been used to increase both validity and reliability (Mays & Pope, 2000). For example, investigation triangulation is applicable as multiple researchers will be involved in this study. Also, methodological triangulation uses more than one resource to gather data, in this case, interviews and various documents.

3.7 Ethical considerations

A few ethical considerations were made during this research to guarantee the wishes of the interviewees. One of them is obtaining a signed approval by using consent forms in order to receive permission for recording the interview. The recordings themselves were stored in the university data regulations with a secure university disk. The recording was transcribed anonymously. The transcripts would only be shared with ZonMw if the project leader explicitly allowed it, as their privacy is of great value. Furthermore, in this paper, the anonymity of the several interviewees was guaranteed by providing certain codes or labels for each interviewee, see appendix VI. Only the function of the project leaders and the ZonMw staff members are displayed. Finally, if the interviewee checked the box to be notified when specific quotes were used, an email was sent to know if they agree to the use of these quotes.

Chapter 4: Results

This chapter presents the results from the conducted document and interview data analysis. In order to build upon existing knowledge, a review on current guidance throughout the project is given. The results are categorized in the three-phase process model as mentioned in the theoretical framework. First, there is explained to what extent impact is described in the documents and which contributions emerged from the document analysis. Second, the guidance of the funder and the role of the funder in the process of creating impact during the project are discussed. It also describes how key actors are involved in projects in the field of responsible use of antibiotics and how they contribute to creating impact. In addition, an overview is given of the barriers and facilitating practices that the funder and project group experience when creating impact. Third, how impact with certain scenarios might go beyond the project and the responsibilities in that matter are discussed hereafter. Finally, the relationship between the funder and the project group is described throughout the results to show the influence on creating impact.

4.1 A brief review on current guidance in creating impact throughout the timeline of a project

According to the research funder, ZonMw, they have several ways of guiding, steering, and motivating the project group in creating impact. In order to know how they can improve and provide better steering, there is inquired what the funder already does in guiding the project group.

The first form of guidance provided by the research funder is organising a workshop for potential applicants. During this workshop, the application process is explained in order to clarify ZonMw's vision. Now due to the covid pandemic, there are no in-person meetings, these informational meetings have been transformed into recorded videos. These videos contain information about the application process and are distributed on relevant platforms. Also, ZonMw has office hours for questions of the project group. These activities are intended to reduce the ambiguities, diminish the vagueness, and indicate what ZonMw pays attention to when judging the application form. This is of importance as the project group will have a higher chance of funding if they know what ZonMw considers relevant. An internist infectiologist as project leader (I4) agreed with this by saying:

"From what I've learned is that very often researchers have a plan and squeeze it into a grant application but it has to be the other way around. ZonMw finds this and this important and then you have to make sure it fits and then you have a much better chance of getting it honoured. Because you have to think much more from ZonMw."

Additionally, a survey was conducted to know how many project leaders gained from the workshop. An overall positive reaction was perceived, they experienced more clarity when filling in the application form compared to other project leaders. The quality of the written implementation was much better articulated of those who attended the workshop compared to those who did not.

Once a project is honoured, an audience summary is requested from the project groups (D11, D20, D30, D39, D48, D58, D67, D78, D89). This will be visualized on the website of ZonMw and it creates visibility for the project. The page is updated throughout the whole project and the results are published at the end. This example could also be seen as dissemination of research results.

The second form is linking the project group to a certain party during the project. One of the parties could be another project group that is related to the current project. The current project group could learn from the finished project on how to create impact or how to improve from mistakes by previous similar projects in creating impact. Another party could be the federation guidelines, as the funder can reach out quickly to the federation due to their network. Furthermore, providing contacts is labeled as

"public-private matchmaking" according to the letters of approvals at ZonMw (D7, D16, D26, D35, D44, D55, D64, D74, D85):

"With the same goal, ZonMw can help you find or enthuse potentially interested parties. If you need such targeted matchmaking or advice about this, please contact sir X. Ultimately, of course, you decide for yourself whether this leads to cooperation."

The matchmaking tries to encourage all project groups to obtain additional funding for the research projects. Committed financing by third parties (such as health insurers and/or pharmaceutical companies) will lead to a lower budget requested to ZonMw, which means that more subsidy applications can possibly be granted.

After a project has been completed, the future perspectives of a project are discussed within GGG. First, a meeting is held to discuss which further steps can be taken in order to implement the results. In the "cluster meeting," the subject of whether the completed project qualifies for VIMP is discussed in more detail. The VIMP provides the project group to have a follow-up implementation project. It consists of a round in which the project group is invited to apply for a project idea that is focused on creating impact beyond the project. This motivates the project group to think about the implementation of research results and if funding is needed. However, there was little to no positive response when asked about VIMP to the interviewed project leaders (I1,I2,I4,I5). Their argument mainly consisted of having a too limited budget for implementation.
Moreover, in the meeting, it can be discussed whether a follow-up study could be considered within other departments of ZonMw. The funder could present promising results to departments, such as translational research and program efficiency studies. If there is potential, the project group is invited to participate in the grant submission of the relevant department. Which eventually would help with the implementation of the research results.
Third, there is considered if the project can be presented in the newsletter or at the yearly GGG congress, which has over 500 visitors including healthcare professionals worldwide. At the GGG congress, a number of successful projects are presented. Interesting are projects who receive an outstanding award called 'pearl projects'. Moreover, in September there is a theme webinar where people can attend the live recording. A number of project leaders illustrate their project with a round table discussion. The last two projects from the GGG program will be presented this September for other funders to have more insight.
Fourth, a webinar is organised three times a year. There are more than a hundred registrations including several actors in the ABR field. In addition, evaluations are used to know the value of these webinars. Finally, an external evaluation of the GGG program is done every five years and a new implementation round is set up with a larger funding budget in comparison with the VIMP.

I. Before: *To what extent is impact discussed on programme level?*

1.1 Defining impact

First, the definition of impact was mapped to know the different perspectives on impact. The definition of impact is divided into two categories according to the interviewees: scientific and social impact. The scientific impact consists of creating awareness about the results of the project, for example by presenting the results at a congress or publishing an article. While social impact refers to an improvement in daily healthcare for the end-users such as patients.

Although more project leaders think that only creating awareness would not improve daily healthcare, an example given by a hospital pharmacist as project leader (I2):

"It is not the case that if the results are in a high impact journal, it is actually used by all doctors".

Other project leaders (I2,I4,I5) agreed with this quote. Still, creating awareness of the results is seen more often as the definition of impact compared to the social impact definition. Many project leaders mentioned that individual practitioners must know about the knowledge that is being generated and have access to it. But a few project leaders mentioned that having both scientific and social impact will create an actual change in the form of better healthcare for patients.

1.2 The extent of impact

1.2.1 Impact on programme level

When analysing the documents on how the funder tries to make researchers aware of the importance of creating impact, it was noticed that the requirements mentioned in the call text were very broad, general, and unspecified. Even so, trauma surgeon as project leader (I1) *mentioned "It is not clear how strict the requirements must be met".* This means that is not clear to what extent impact can be written in the application form. The staff members of ZonMw acknowledge this matter by the questions they receive. For example, an implementation specialist at ZonMw (I7) said:

"*In the application form is stated: ensure that there is support. I can imagine that some project leaders then think: well, what do you mean by that? Or how do I do that? So more explanation is required".*

An improvement could be to display an good example of a completed application form at the website. In this way, the project group has an example of the extent to which it is expected to write about impact. Further, the research funder would like to see a more detailed plan that is aligned with different stakeholders but they also understand that the intended impact is a forecast. Therefore, the project might deviate from the promised contributions mentioned. Lastly, if the requirements in call text would be more specified, it may lead to not being applicable in a particular project.

1.2.2 Contributions on project level

The most frequent intended outcome of a project seen in the detailed application (D4, D14, D24, D33, D42, D53, D62, D70, D83) is publications. Every project is published worldwide to reach as many researchers and practitioners as possible. Publications are the most frequent outcome due to the fact that project leaders consider the publication as his or her responsibility. As said by the trauma surgeon as project leader (I1): *"In any case, it is my concern that the publication will be completed".* Most of the projects have a Ph.D. student in their project group who is required to deliver an article at the end of the project. So, spreading the information and knowledge is a task that is considered by the project leader as their responsibility.

Often the publications are used for guideline development, which can be eventually be seen as a contribution to creating impact. Physicians, nurses, and many other healthcare workers are instructed with certain guidelines. A change in a guideline could eventually lead to a change in daily practice. Several project leaders think of a guideline as really important, a hospital pharmacist as project leader (I3) said: "Every hospital in the Netherlands runs on that protocol. So how do you want more implementation than that?". The change in guidelines at the SWAB, NHG, or other authorities is mostly requested once a project has finished. This is because the guideline cannot be adjusted without

any evidence. Once the process of adjusting a guideline has started, it can take up almost 10 years before that an adjustment is made:

"A guideline is just tough, because sometimes it takes ten years. Hey, so It is not at all up to the researcher alone?" - Internist infectiologist as project leader (I4)

This is one of the reasons why impact is a long-term process. However, according to a hospital pharmacist as project leader (I3), a change in daily healthcare could be achieved without implementing any guidelines. He provides the example of his project wherein a smaller scale of patients a change was realised due to his project. He achieved this change by monitoring and checking the availability of the treatment. This emphasizes the monitoring element in creating impact. So, in this case, both the alignment efforts and contributions to action are met which resulted in a successful specific contribution.

Further, presentations for the research field and the end-users are the second frequent intended outcome seen in the detailed application (D4, D14, D24, D33, D42, D53, D62, D70, D83). These presentations are given at conferences, symposiums, and/or other events. This is a great way to inform the interested parties. Information about how impact was created during the project and how the different parties were involved in creating impact can be discussed. Besides, if the project group highlights the relevance of the research and precisely shows how the results can be implemented in daily healthcare, then there is be a higher chance of another researcher or interested party showing interest which is the most wanted contribution.

1.3 Compliance culture

The project group is required to fill in the section: *"implementation feasibilities"* in the project idea as a part of the grant submission. This requirement can be enforced but there is disagreement on the value of this. The willingness of project leaders to comply with the requirements is linked to how much they value creating impact. On the one hand, requirements such as filling in the implementation plan are the only way to force researchers to pay attention to these issues. The reason for asking impact at an early stage is to obligate the project group to think beyond the project. A hospital pharmacist as project leader (I2) agreed with this saying*: "It is important to know what added value is available in such a project."* On the other hand, such requirements may lead to a culture of compliance in which minimal effort is made and planning is seen as a "tick-box" exercise that has no further value (Neylon, 2017). As in most documents, there was not written how the envisioned contributions (products and/or activities) would be achieved. The steps in creating impact and who they will contact are often not mentioned. The alignment to involve potential users in formulating research proposals based on the anticipating perceived needs is frequently missing. In this view, requirements may actually be damaging the effort to effect culture change towards improving healthcare practice (Neylon, 2017).

The project ideas should be seen as living documents that form the basis of collaboration between researchers, funders, and other parties throughout the life of a research project (Neylon, 2017). This approach emphasizes the importance of clarifying the responsibilities of various stakeholders and ensuring that researchers are both recognized for good practice and see tangible benefits.

1.4 Accessible contact

The funder is considered to have a formal attitude due to very strict, legally sealed letters. These are received by project leaders and can be the only "image" they have of the funder The research funder is mostly seen as a kind of control organization, where they constantly hold project groups accountable

(I1, I2, I3, I5). Therefore, the threshold for contacting the funder is really high. Surprisingly, an internist infectiologist as project leader (I4) contacted ZonMw to know what they want to see in the grant application:

"It's always a bit vague at the beginning. But I do think they can have low-threshold contact. If you try once, you'll be fine. If I don't understand it, then I just call in. There is also a sentence there: if you have more information, please contact me. I'll do that then."

Other project leaders (I1, I2, I3, I5) have never contacted ZonMw. If the funder would be more accessible, then more project leaders would contact the funder. Ideally, at the start of the project, the funder should have a telephone conversation with the project leader in order to lower the threshold. Hopefully this will result in more approachability which can help build more trust in the relationship between the financier and project leader. The ultimate goal of being more accessible would be to complete the application form faster and have less paperwork for project groups.

II. During: *What have project teams done to ensure impact during the course of the projects (project level) and how did the funder steer in this process?*

2.1 Steering and encouraging the project group

The progress of impact is documented throughout the projects to provide a reflection on investments that turn into (ac)countable results or returns in a long-term perspective. In these documents, multiple forms of steering in creating impact were noticed. Throughout the project, the funder provides feedback on several documents such as the progress report and end report. One ZonMw staff member is in charge of one or more projects, this employee attentively looks through the documents of the project group and provides feedback if necessary. The employee can steer the project group in ensuring that the project group thinks more about a certain aspect of impact. Certain questions are asked or comments are made in the reports to ensure that the results can be implemented. A good example is seen in the recommendation on project idea document of project 1 (D2):

"the applicant must provide the route to implementation in practice in the good use of medicines request".

This example showcases the importance of the research funder in guiding the project group. However, this form of guidance is not seen very often during the project. This is due to the fact that the project only has a few contact moments, around 2-4 times depending on the needs of both parties, which can be the result of the limited timeframe (projectification). The need for more contact moments differs in project leaders, some would like more contact but others not at all. ZonMw staff members do want more contact moments with the project leaders in thinking about creating impact:

"we therefore want more contact somewhere, that would be of course just good if we could just be a bit more on top of that and help with that. On the other hand, I don't see that happening completely either, just in terms of time, the amount of projects we have and then it's just not always really feasible. That's why we request forms and things like that, so that we mainly get all the right information from them, that we simply ask the right questions, actually get everything out of the contact moments." - implementation specialist at ZonMw (I9)

Unfortunately, it is almost not practically possible for the staff members of ZonMw to align with the need for more contact. Although it has been shown that more contact between the project group and ZonMw is beneficial. The intensive contact approach is applied during the large open rounds, where

only a few explicit projects are funded. From the very beginning, high intensive contact is made with those project leaders. Several meetings are organized and the project leader is taken by the hand in the thinking process of how they can take the project forward in a good way. Several meetings are organized and the research funder actively participates in the process of how the project group can create impact beyond the project.

"the funder turns into a sparring partner and this approach is very much appreciated by the project leaders." - head of cluster rational pharmacotherapy at ZonMw (I8)

2.1.1 Capacity to monitor and support creation of impact is a systemic structural issue

The importance of capacity and time availability within the research funder is observed in this case study. In particular, it was noted that there is a systemic structural problem with impact creation. The funder organises their programs with project leaders having responsibility for management, communication, and in some cases soliciting proposals for grants. With communication flowing through a single person, any policy change or implementation effort requires each project leader to gain sufficient expertise in a new area to actually implement the product such as a guideline. Frequently responsibility for tracking the impact after the project also rests with individual project leaders. The need to examine and improve capacity at the funder level, alongside addressing capacity building amongst grantees aligns well with an agenda for a culture switch according to Terry, Littler, & Olliaro, 2018. Capacity building on both sides for collaboration offers opportunities to develop a common narrative, and thus a common route to creating impact (Terry, Littler, & Olliaro, 2018).

2.2 Program committee members as a linked actor

In the documentation of the projects, there is some feedback on the creation of impact from the members of the program committee. These members are seen as linked actors because they indirectly influence how the project group will create impact. The question arises on how valuable the comments of the committee for the project group are. In some cases, an answer to the comments and/or questions from the committee was not provided. This resulted in no improvements on how impact could be created during and after the project. The question is whether the funder should penalize the project group for not providing this information. The funder could for example put the funding on hold until the questions are answered. When the funder was asked for an explanation about how this could happen, they said:

"*If it is mentioned in the letter of approval then it will certainly be requested in the format. However, it could be that not every comment of the committee is modified into a requirement for funding."*

Once in a while, the members of the committee were contradicting each other. It is certainly unrealistic to receive the same feedback from the committee members. However, it is a concern when one member accepts and the other member rejects the same project. It is expected from the members to have similar critical thinking and demands. Their opinions can differ from each other, which is positive, but how reliable are the judgments from the committee if their feedback is conflicting.
So, the feedback from the committee is sometimes not taken into account as well as its reliability is questioned.

3. Role of the research funder, in this case ZonMw, in creating impact during the project

3.1 Project group perspective

The responses on the role of the funder in creating impact can be divided into three groups. The first group includes project leaders who argue that the funder should not get involved in any of the project group activities. A hospital pharmacist as project leader (I2) mentioned that they should just stay out of it and the funder cannot help in any matter:

"As a research group, you actually make sure that you can do a good job of supervising a project yourself, and I don't think a financier should play a primary role in that …There was plenty of expertise in the group. I don't think the financier can help there. Otherwise, there might be a conflict of interests."

The perspective on the funder is pure of providing the funding, the basic need for conducting a project, and nothing more. This view on the research funder might have emerged from the science culture. As long as the perspective on the funder within the culture of project leaders does not change, the relationship between the funder and project leaders will not improve.

The second group notes that the funder is allowed to check up on the progress. Multiple project leaders (I2, I3, I4, I5) mentioned that a follow up on the agreements described in the detailed application is fair. However, further guidance is not needed when the project group did not ask for it. If the funder pushes for it, it might fuel the controlling behaviour of the funder.

"I think it's neat as a financier to be as little possible involved during the implementation of the project. So if you agree that there will be a certain product, that you are going to do something, then it is not strange that you are asked about it, whether you have actually done it. But that's what it should be."

The third group thinks of the funder as a participating and experienced party. The funder can have a larger role in creating impact than they have now. They are open to the scenario's discussed later in section 5. These project leaders do not see ZonMw as just a party who provides money, but as a party who can also offer their expertise. Especially for projects groups who do not have a large network in the field and/or need more guidance in creating impact. Supporting this statement, a trauma surgeon as project leader mentioned: *"As soon as ZonMw can contribute or say: gosh if you do this and this with this data, so that the impact becomes greater, I would certainly appreciate that."*

3.2 ZonMw perspective

Several staff members of ZonMw agree with parts of the second and third views. The funder thinks that they have some kind of control over the project group. This is also seen in the letter of approval (D7, D16, D26, D35, D44, D55, D64, D74, D85). If certain requirements are asked then the project group has to comply:

"we decide if the project group will receive the next batch of money. We can say: we stop the projects, you don't get any more money, because you just don't deliver the results that you promised." - program manager at ZonMw (I6)

However, other ZonMw employees would like to attach more importance to the role of the funder in creating impact than just being an authority figure. ZonMw does not want to be viewed as only the party who provides a budget: *"We are not someone who just give money and say please do your thing*

and we'll see at the end" (implementation specialist at ZonMw – I9). The research funder wants to guide the project group in the best way possible. Nevertheless, it depends on the project leader whether he is open to the idea of guidance from the funder.

ZonMw thinks they could have a crucial role in providing guidance for the project group, the vision they have is: *"our vision is that we stay in touch with each other (project leader) and keep the lines open. However, the perspective from which bear responsibility is different on both sides. Very formally, of course, we must account to our client as the Ministry of Health, Welfare and Sport. But our assignment is of course: you have to make better use of existing medicines and you can only do that if that actually happens in practice, otherwise you won't achieve that of course".* Adding to this, the most important vision ZonMw has is:

"Funder is not there to control, but to help and facilitate them (project groups)"

The vision includes how the research funder can facilitate impact and how they can help them by, for example: creating collaborations between outside ZonMw and within ZonMw. Such as introducing to other projects to learn from or parties who can initiate the process of implementation can be approached. The main message from ZonMw is that there is more possible than just knowledge products.

3.2.1 Conflict of interest

There is a downside to helping and facilitating the project group, which is a conflict of interest. This phenomenon has been mentioned before in a quote and is also mentioned by other interviewees. Conflicts of interest can influence how the projects are designed, conducted, and analysed. Conflicts of interest are often defined as *"a set of circumstances that creates a risk that professional judgment or actions regarding a primary interest will be unduly influenced by a secondary interest"* (Froude, 2012). In this case, the conflict of interest is a risk of influence by a secondary interest, which is the research funder. If the research funder is involved in how a trial is designed or conducted, it might be beneficial by achieving the return on investment, depending on the published results of the trial. To minimize undue influence from a conflict of interest and to facilitate impartiality, the limit of guidance provided by the funder should be made clear.

"If we start collaborating too much with those projects, great, but if the project failed. We almost say to ourselves you didn't do a good job. So it has to be to a certain extent. I think we can advise, nothing more. It is important that you will not be part of the project, but indeed stand as a third party."
– implementation specialist at ZonMw (I7)

Although the perspective may be primarily from slightly different angles, in the end, the funder and project groups have the same interest. They both want the best for patients or other end-users by having a successful project and putting the interests of the patient first.

4.Trust during the project

In order to have impact products and activities, a good relation(ship) of trust between the project group and the funder is acquired. The funder must be able to trust the project group in delivering the promised results. Mutually, the project group has to trust the funder in providing the promised finances. Most project leaders (I2, I3, I4,I5) have mentioned that they appreciate a good trust relationship. Trust arises after a long period of time which does not align with the short timeframe of the project. For instance, a Ph.D. student in the project group (I5) mentioned: *"every now and then a little faith in what the researcher is proposing to change course is really appreciated… I know that*

there was a bond of trust, but that could have been more. ZonMw is not unique in this, it also applies to other subsidy providers." This quote makes it clear that little trust in project groups is present among many funders.

III. After the project: *what did the project teams undertake in creating impact?*

The following subchapter answers this question by first looking at who is responsible for implementing the results and then at the relationship between the funder and the project group

3.1 Monitoring after a project

One of the key findings from the documents and interviews is that monitoring is a part of creating impact beyond the completed project. A quote from an internist infectiologist as project leader (I4) supporting this statement:

"You just have to make sure everyone knows that the research is performed and then ensure that all the doctors start working with the drug every day. And if you keep monitoring them, then it works…People only continue to do something if they are continuously tested for it, by an authority such as IGJ (Healthcare and Youth Care Inspectorate)".

In one project (project 6), feedback was given to the project group on their end report (D59). They had to incorporate this into the project before receiving the final grant. Such a requirement may be the only way of ensuring that the necessary integration is accomplished . Up to this point, the financier of the project group can set requirements. The research funder does not have the authority to check or monitor the project groups after the project has been completed.

"We can check what happens during a project and what they promised in it. But then we can't check them for things outside of that project" - implementation specialist at ZonMw (I7)

So, the definition of creating impact does not solely consist of creating awareness and improving daily healthcare as mentioned in the theoretical framework and section 1.2, it should also include monitoring by whichever party fits.

3.2 Flexibility and trust

The project group is obliged to inform ZonMw in the next four years about any contributions once the project has been completed. This is mentioned in the final reports (D11, D20, D30, D39, D48, D58, D67, D78, D89). The question, however, is whether the project leader actually does this. Project leaders may no longer feel a shared sense of purpose with the funder after the project has ended. This might be the result of an active intervention (being required to do something that does not align with their values) or a lack of intervention according to Terry, Littler, & Olliaro, 2018. In these cases, the message is sent that the purported interest of the funder is not real. Furthermore, a lack of interaction and reinforcement over time could be a reason to not engage with the funder.

Since the funder cannot be the controller in every step of creating impact. They have to rely on the project group to accomplish the promised results within the given budget and only deviate if there is a valid reason to. As deviations in a project are unpredictable, the funder must trust and also be flexible about the project group in creating the impact. So, being flexible is just as important as having trust. An implementation specialist at ZonMw (I9) supported this statement:

"the relationship depends on how flexible we can be as a funder. We can make sure they get more money if a project is delayed, especially if it doesn't go the way they want. Because if you are not flexible then it is wasted time and money. Nevertheless, flexibility produces results that are useful to us."

Thus, this indicates that flexibility and trust in the relationship between financier and project leader are twined together.

3.3 Acknowledgment

Multiple ZonMw employees (I5,I6,I7) mentioned that the research funder could give a bit of recognition to the project leaders in order to stimulate creating impact after completing the project. By recognizing and appreciating what the project group does beyond the project and not emphasising publishments, a beneficial effect can be achieved. An example is given by an implementation specialist at ZonMw:

"I think a good example is that we recently called a project manager after his project. He hadn't asked for it himself and we said: oh, but we think these are very nice results. We want you to continue with this. Can't we think of something to do VIMP application anyway? We actually really like that you called, that you (funder) are also happy with what we have done and that you want to think along with us, so they thought that was very positive. So, ZonMw can also give a bit of recognition"

The need for acknowledgment and the funder trying to appreciate them can be seen as a alignment effort. The contribution to action will hopefully eventually be a implementation project, such as a VIMP. In this way, the results might have a higher chance on ensuring a noticeable change in daily healthcare.

4. Responsibility – who should implement results?

4.1 Project Group

Many project leaders do not think it is their responsibility to implement the results. Project leaders mention different reasons, such as *"I don't feel that my responsibility because impact is much bigger than this project" or "implementation… that's not my expertise, that's not my responsibility someone else has to do it".*

On the other hand, interestingly, there was one project leader, the hospital pharmacist (I3, who said: *"We have already interpreted that as an part of the application for funding. We had an agreement as a result of this project to publish a guideline. So I think that's just part of the project, even after it has ended."* Several other project leaders agreed with the fact that they should deliver what they promised in the application form. The project group should deliver what they promised in the project idea even if it is after the project has been completed. The project group has received funding for the implementation activities and products. So, it is the responsibility of the project group to achieve the proposed impact. For example, the project group has promised to implement and/or adjust a guideline as a part of creating impact. Most of the time, a guideline can be adjusted after the generated research results. This means the project group should be responsible for implementing that guideline after the completed project as they received funding for it.

Another remarkable comment made by an internist infectiologist as project leader (I4) was: *"The implementation no, but I do feel like a duty, if all those associations like tonight's, if they email me and ask, would you tell me something about a committee meeting now, that's my duty."* This means that the

project leaders do think it is their duty to spread awareness about the completed project. Likewise, another project leader and PhD student (I2, I5) thought it is their responsibility for an initiative, but not for the final steps which should be picked up by another party, such as professional associations.

4.2 Professional associations

Almost every interviewee mentioned professional associations as the ones responsible for implementing results. A professional association is a group of people with the same type of education and/or profession, who have joined together. For example, there are professional associations for accountants, actuaries, lawyers, notaries, doctors, pharmacists, tax consultants, internists, and dermatologists. These associations take on various tasks. Such as, assessing the quality of training, maintaining contact with health insurers, and ensuring greater awareness of a profession (Shaw., 2014). According to a internist infectiologist as project leader, the professional associations should take on another task:

"The professional associations simply have to revise their own protocols every few years and I assume that they will read literature, and then they will come to our project automatically. At the professional groups or at the professional associations or such organizations that actually have to carry out the implementation."

4.3 Research funders

Arguments for the funder being responsible are given by an implementation specialist at ZonMw: "*But then it would have to appoint another party, director, follow up projects, results and I think we are the most obvious party at the moment as there is no one at the moment* ". However, this answer is not seen with other interviewees, both ZonMw staff members as project leaders. ZonMw's program manager mostly think that the role of the funder is to keep inquiring:

"The role of the funder is to keep asking questions: as far as I'm concerned, even more structurally, even more systematically, they should in fact continue to inquire with the project leaders years after the project has been completed. Actually to just keep following how far are you now and when will it really change practice… In any case, we are not solely responsible for impact, but we can very well stimulate it. How? I think that we from ZonMw can bring parties together and by setting requirements in our call for texts that we can encourage researchers to collaborate as much as possible and that increases the chance of impact."

Adding to the last part of the quote, a program manager at ZonMw noted that they can initiate and ensure other parties take action. For example, sending a letter to the related associations so they actually carry out some sort of action. Although only a letter might not be enough, a more intensive contact might be needed. The head of cluster rational pharmacotherapy at ZonMw mentioned that they are willing to make that effort in order to align with the needs of different parties. Further, the most important encouragement to implement the results is given in the form of financing, because implementation and impact cost time and therefore money. Implementing specific results from a completed project can be seen as a whole new project. Therefore, the setup of the implementation round in rational pharmacotherapy is of uttermost importance.

5. Scenarios

Three different scenarios were given to the interviewees to indicate which actors are important in creating impact. In addition, the needs of the different actors were outlined depending on what is already present in the world of the actor 'telling' the screenplay.

5.1 Perfect guidance

The first scenario was about how perfect supervision from the financier looks like according to the project group. The trauma surgeon as project leader mentioned the amount of paperwork as a headache: *"It just seems to get harder, more complex, more intense to a level that to me it really becomes almost absurd."*

Such an amount of paperwork could lead to a culture of compliance in which minimal effort is made and filling out the papers can be seen as a "tick-box" exercise that has no further value (Neylon, 2017), as mentioned before in section 1.2.1. The feedback of the several project leaders was presented to the staff members of ZonMw. They responded with impotence due to their higher orders. ZonMw funds the projects in order of the ministry of health. So, the funder is responsible for gathering all the required documentation.

The implementation specialist at ZonMw (I7) described their ideal guidance as more frequent contact between both parties and more open communication by being more accessible. However, as mentioned in section 2.2, this is difficult to achieve due to the lack of capacity.

5.2 Health planning

The second scenario suggested formulating a plan about creating impact in the best possible way. This way of planning can be considered to be a part of health planning. Health planning represents the first step in an orderly process to accomplish the things necessary to improve the health status of individuals and populations. The purpose of health planning is to meet the health needs and demands of the people The importance of a strong interface between planning and health has long been recognised (Frumkin, 2005; Wanless, 2004; Palmer, 1998). However, the two sectors remain out of touch with one another, some implications, which are recognized in many countries, are built and natural environments that lead to poor health and well-being (Braubach et al., 2007; Cave and Molyneux, 2004; Fitzpatrick, 1978). The role of planning obligations in facilitating health benefits and funding health services has been recognised and specific advice has been given to health authorities on how best to access them (Blackshaw et al., 2007).

Exchanging thoughts beforehand with the funder about the possible ways in which the project group can achieve is proposed. For example, the funder can exchange ideas from a previous research group from whom the funder gained a lot of experience. As a result of all experiences, the research funder knows the success stories and the pitfalls of a project. The plan is mostly made during the formulation phase, however, this timing is questioned by many project leaders.

"At the beginning you are still busy with everything to get the project off the ground, so that is too early. Especially during the project you are just sitting on that roaring train, so that's very difficult to oversee what you want to do beyond the project… Hey, but then at the end you have your results." - Internist infectiologist as project leader (I4)

According to project leaders, it is better to have a meeting at the end of the project, which can be labelled as an exit conversation. In the end, a better thought can be given to implementing the results and how to ensure that the results are available and usable for a long time.

5.2.1 Resistance of project group

Some project leaders were not keen on this idea, as it will eventually be the responsibility of the project group lacking the capacity to do so. The research funder responded on this matter. They do not want to burden the project leader even more, so the funder is willing to be proactive and take the lead in formulating the plan that ultimately benefits the project group. In this way, it can be prevented that the compliance culture referred to in section 1.2.1 is strengthened. An implementation specialist at ZonMw supported this statement:

"Most think so, if we let this info run along during the project. That is useful for us, but certainly also for them: 'the what's in it for me', that they see the advancing insight. This will allow us the PL to create more awareness of what they can do and where the financier can help. We are not doing this to increase bureaucracy, but to help you and really generate impact. "

So, the research funder expects little resistance if the advantages are communicated to the project leader. There were two project leaders (I1, I3) who would appreciate formulating a health plan. They are open to sparring about the project in advance and explore the possibilities together with the research funder. Further, in the case of health planning, conflict of interest should an important thing to consider.

5.3 Implementation expert

In the third scenario, there was asked whether the project leader would like an implementation expert in their group. Every project leader (I1,I3,I4,I5), except one (I2), would have liked to include an implementation expert. The one exception did not really see the added value of the expert in his project. Still, the importance of an implementation expert is seen by many project leaders as most of them only know how to conduct research. Most project leaders even mentioned: "we are just researchers!". The expert will be more knowledgeable about the several steps that have to be taken in order to create impact. It should ultimately ease the burden of project leaders so they can focus on what they know. The program manager at ZonMw (I5) aligns with this thought by saying:

"I think it is important that they are working on it and that there is also help if necessary. Also, you don't have to do everything yourself. But of course they can also simply enlist the help of people who do have that expertise and can think along with it. But in the end, I think it is the responsibility of a project leader to start something up, because it takes the initiative to involve people and do something with it."

However, the only problem with involving an implementation expert into the project is the availability. Unfortunately, there are not a lot experts in the Netherlands. The process of providing a wider range of implementation expert is still an ongoing process. ZonMw has thought about a solution for this issue*: "that is why we are now looking together with another program if it will be able to train people to become an implementation specialist at the company's expense.*

While we (the funder) do not become the implementation experts ourselves, but that they also hire implementation experts themselves or include them in the project group. And the person tells about the current issues related to impact to us. Then we may not even have to do that conversation about formulating a health plan together beforehand"

Chapter 5: Discussion and conclusion

The aim of this research is to gain insight into the role of the funder in creating health research impact from completed research projects. In addition, the focus is on how impact exceeds these research projects and how the research funder could provide guidance in this process. Hereby focussing on one funder as a case, which is ZonMw. The following sections discuss these views with the associated scientific literature. Further, implications for future research, research funder, and project groups will be discussed. Finally, the limitations of this study and the conclusion of this research are given.

5. 1 Underlying dimensions of the results

One of the key findings that appeared from the document analyses was that education as an end-field is not seen frequently. This is remarkable, as education is one of the four areas on which the ZIAF framework focuses. So, it would be expected that the research funder motivates the project group to contribute to the field of education as well. While most knowledge products and contributions are focused on either research, policy, or practical field. Literature has mentioned that education to the generic public is also seen as advocating the results which is one of the many roles a funder can take on (Terry, Littler, & Olliaro, 2018; Bond, Cave, & Ballantyne, 2013).

Another key finding was the need from the funder and a few project leaders for health planning – writing an implementation together with the project leader. However, this type of implementation strategy is questioned by some papers (Bond, Cave, & Ballantyne, 2013; Blackshaw et al 2007; Palmer, 1998). On one hand, it was specified that health planning sets the framework for development decisions and explicit direction towards health outcomes. On the other hand, key decisions were taken with little or no consideration of the potential health and well-being implications (Bond, Cave, & Ballantyne, 2013; Blackshaw et al 2007; Palmer, 1998). The paper by Bond, Cave, & Ballantyne, 2013 researched health planning in both the East of England and in the East Midlands. Therefore, it could be that in the Netherlands, health planning might be not as effective. However, this has not been investigated yet.

In an ideal world, it would be feasible to develop systems in which an implementation plan is written with an expert or with the funder. This plan would be part of the grant application process, but it would be further developed once a project is approved. Systems supporting its production would enable collaborative authoring and structured planning on expected outputs that could be captured as part of this process which is in correspondence with BrauBach et al., 2007. In turn, the document could serve as a developing manifest for data outputs as the project proceeds, as a checklist and basis for discussion between the funder and research group (BrauBach et al., 2007). Furthermore, it could be used as a source of information on data management and access arrangements to be passed to publishers when relevant articles are published. Finally, it could form a record, manifest, and index for the interested parties when they are archived following the project completion (BrauBach et al., 2007).

With limited resources, it will be crucial to develop tools and design the scope of impact on the expectations of researchers. This will contribute to the alignment of the researcher and funder motivations. Simply requiring implementation planning at the proposal stage without providing support will likely lead to the production of documents that will be ignored according to Curry et al., 2020 and Froude, 2012. Providing ongoing support will be resource-intensive. Therefore it is important to identify the best point to apply available resources, and the scope of data the funder is most concerned with.

5.2 Conditions for creating health research impact

To ensure that the creation of impact can be beyond the limited time span of a project, a few conditions emerged from the document and interview analysis.

First, the strength of the evidence for a particular research finding must be confirmed before efforts are made to disseminate and apply its results. Impact requires results that can be practically implemented. Both funders and researchers must clearly take responsibility for this. Literature agrees on how important it is that both parties are pro-active in order to have a noticeable change in healthcare and eventually on patients' health (Froude, 2012).

Second, since impact tends to follow a pathway starting with aspiration and only gradually moving to concrete requirements, the ability to monitor progress is often limited as mentioned in the results. While requiring implementation feasibilities in the project idea is often seen as a universal and relatively low burden, follow-up on performance after the project appears as a high burden for both researchers and funders according to Neylon 2017. Both the financial and political costs of putting systems in place for further tracking of the creation of impact mean these systems are not in place when they are needed. Neylon (2017) added to this: "*This, in turn, makes both support from the funder and ongoing engagement with the project leader difficult, focussing compliance tracking on very specific points of the project life cycle. This tends to exacerbate the risk of developing a compliance culture*".

Third, a concern is whether sanctions should be a part of the conditions for creating health research impact. The project leader may be sanctioned for not providing the required answers was mentioned in the results. Penalizing the project group could perhaps create a negative relationship between the funder and the project group. A few reasons are given, it could lower the trust of the group towards the funder, the group could be more stressed to deliver the right answer, the focus would not be as much on the research as it should be and the group may find the funder too strict. The negative relationship would not be beneficial for both sides as the funder should trust the project group to deliver what they promised but the other way around the same applies. Therefore penalizing could eventually result in a disbenefit.

5.3 The role of the funder in creating impact: before, during and after a project

The traditional roles of the funder mentioned by Brantnell et al 2015 are (a) receiving grant applications, (b) evaluating them, (c) funding the most suitable ones, and (d) evaluating research outputs. These steps are performed by ZonMw. But they also want to facilitate the steps leading to implementation and implementation itself. This goes beyond the four traditional tasks mentioned above (roles a–d).

The results section described how the funder steered the project group in three different phases of a project. In addition, the different views on what the role of the funder should be in these phases were illustrated. Throughout the whole project, the role of the funder can be mostly facilitating. Several previous studies have recognized different facilitative roles for funders: (1) requiring researchers to write an implementation plan together with their grant application (2) involvement in the implementation of healthcare innovations (3) managing implementation programs (4) creating interaction between researchers and research users (5) the dissemination of research results, and (6) advocating the use of research results (Brantnell et al., 2015; Froude, 2012, Sibbald et al., 2014). There will be looked at how these different roles are present in ZonMw.

I. Before the project: formulation phase

The first phase mostly consists of the funder requiring the project group to describe their "implementation feasibility". This is seen in the documents of the grant submission process. The requirement corresponds with different literature about how research funders can set certain criteria for projects to include implementation. Creating conditions for implementation through legislation in implementation matters according to Curry et al., 2020. Therefore, their role in the first phase can be viewed as more of an authoritative figure. They can demand impact based on the fact that the research funder provides access to funding to the project group. Yet, ZonMw does acknowledge their authority but would not want to be seen that way. Their vision of a research funder, as mentioned in the result section 5.3, is to be more approachable and have a facilitating role in requiring researchers to write an implementation plan together with their grant application (1).

Further, the question raised in the results whether writing the implementation feasibility in the grant submission is viewed as merely an administrative requirement is supported by several papers (Brantnell et al., 2015; Curry et al., 2020; Neylon, 2017). The tick-box exercise might create a compliance culture. This paper noted that this exercise could actually damage the goal of supporting a culture where creating impact is a part of standard practice (Neylon, 2017). At the same time, it emerged from the interviews that the project leaders strongly believed that it was necessary to encourage researchers to think about creating impact and the necessary steps to achieve it. Without a formal requirement at some point in the submission process, this would almost never happen. While strongly supporting the idea that the creation impact should be considered throughout the project lifecycle, there was an agreement in corresponding literature that the grant submission remains the most obvious place to insert a compliance requirement (Frumkin et al., 2005; Neylon, 2017).

II. During the project: production phase

The role of the funder during the project is encouraging, motivating, and stimulating the project group to create impact. The funder tries to attend on how the project group can already inform certain stakeholders about their projects or how the project group could perform certain steps that will be beneficial. In addition, ZonMw fulfils a helping role by being open to the project groups who need tips or who have difficulty with research in general. Especially for researchers who are new to the field and don't have a larger network compared to researchers who are more experienced. It is necessary to encourage and help these young researchers in any way possible.

Furthermore, in this phase, the research funder does not know whether the progress reports are being filled in as a tick-box exercise. Even the project leaders were not open about this subject. Therefore, this will a difficult and interesting topic for further research. In addition, there is a possibility that researchers tend to elucidate on implementation feasibilities in a way that is thought to be expected from them, without seeing the added value of including this section throughout the project. Moreover, interviews made clear that some project leaders do not know what is expected of them when elaborating on implementation. This implies that ZonMw should make it more clear why creating impact during an impact is so important in the specific context of projects.

III. After the project: knowledge extension phase

After the project, the funder can have the greatest facilitating role in creating impact. Brantnell et al., 2015 explain that the research funder can 4) create interaction between researchers and research users (5) disseminate the research results, and (6) do "Advocacy work" consists of the funder

communicating to decision-makers that implementation is important and trying to persuade decision-makers to invest in implementation i.e. advocating the use of research results.

These three roles have been seen at the research funder, ZonMw. They are open to inform the designated party who is responsible for implementing the results. The most obvious party to implement the results that appeared from the interviews are the professional associations. Informing professional associations or health professionals is an implementation strategy targeting individual behavior change in practitioners according to Tetroe et a., (2008). This strategy is identified as merely effective in different settings. This implies that ZonMw could try to apply this strategy.

With regard to the facilitating role of the research funders in creating impact, ZonMw lacked in one role: “Monitoring of implementation results”. They did not illustrate this role with specific activities and therefore it can be a potential role that the funder could or should fulfil. This is according to Froude, 2012 and Brantnell et al., 2015 an important aspect in ensuring the implementation of research results. Other national private funders have a structured way to monitor the results of the implementation, either through an annually published report describing the study results and its implementation or through an updated registry of treatments performed and patient outcomes (Froude, 2012; Brantnell et al., 2015). Whereas ZonMw did have a requirement to monitor the implementation of research results, a report called the “Voortgangreport afloop project” (VRAP). The research funder erased it from the program due to the lack of capacity to monitor these completed projects (ZonMw., 2020). Thus, a clear challenge that emerges from existing analyses, as well as the interviews, is the balance between compliance monitoring and capacity and time availability within funders.

5.4 ZonMw as a research funder

When comparing ZonMw as a research funder to how other funders are described in the literature (Hackett, 1990; Sibbald et al., 2014; Tetroe, & Graham, 2014; Terry, Littler, & Olliaro, 2018). It is remarkable that ZonMw already is way ahead in terms of drawing attention to creating impact throughout the three phases of a project. Tetroe, & Graham (2014) praise ZonMw for their approach in creating impact during the project, and after a completed project. The research funder tries to assist their researchers in not only disseminating but also implementing their research findings. Furthermore, in the cluster meetings, enough knowledge is gained about the completed projects to decide whether or not it will be used for additional dissemination and implementation activities like VIMP or STIP. ZonMw assesses the most promising projects for more implementation support. Interesting are projects who are outstanding, those are called the "pearls" (ZonMw 2020). They qualify for special attention and resources in a full implementation plan. Not surprisingly, health research "industry" funding has differing opinions about what should be transferred to whom, when, and by whom (Ravensbergen and Lomas 2005).

In addition, ZonMw yearly participates in the “Ensuring Value In Research” (EViR) meeting where funders around the world can engage. Funders can share their experiences and learn from each other. Likewise, Tetroe et al (2008) mentioned that collaboration and communication between funders can broaden the scope of individual funders’ activities and increase the likelihood that they will be evaluated.

5.5 Culture switch

"The culture of scientific impact is much stronger than the social impact, it is our intention to change that." – Implementation specialist at ZonMw

The final topic discussed will about the culture in which the project takes place. Many interviewees including both project leaders and ZonMw staff members mentioned a culture switch or change. While researchers have intrinsic motivation to actually create impact, still the most frequent contribution seen is publications. The science culture of researchers consists mostly of publication pressures and quantitative performance. Publications are required to demonstrate the worth of an investment. Meaning producing articles and publications in high-end journals is the main goal. For many scientists is quantity and rapidity of their work as important as its quality (Hacket, 1990). This matters greatly to graduating or receiving a higher rank and having a successful career. While the origins of such functions lie in the history of the university, their growth and differentiation are fuelled by the dynamics of the academic research system (Hacket, 1990). Glasner., 1998 and Neylon et al., 2017 agree with this by saying that the positions are marginal to academe but as researchers, they are not marginal to the intellectual enterprise of science.

Further, project leaders must play two roles, manager of the project group and employer such as doctor, pharmacist, or internist, which may place inconsistent demands on them. The expectation is that the impact products or activities are implemented, monitored, and evaluated by project leaders who are the main point of contact for projects. A productive act to enhance the creation of impact may lead to empower and support project leaders (Rammert et al., 2017). This could be achieved through the training and the support of individual project leaders. In addition, a group of internal experts who can support others, or via the provision of external support can be created leaders (Rammert et al., 2017). This group can provide their ongoing support mechanism for both research funders' staff and project group.

An article by E.J. Hackett (1990) discusses that the relation of research and teaching within the research university, for example, is a recent arrangement that limits and perhaps compromises the purposes of both efforts. In college, students who are being prepared to become researchers are focused only on delivering publications. Almost no attention is paid to what happens after those publications (and with the results). Thus, the research science culture actually starts at the counters of the university. If the mentality can be changed there, a culture switch can be seen in future research projects.

Accordingly, a cultural switch must be made in the research science culture where the publication pressure is relieved and the eventual result in practice matters (Hackett, 1990; Glasner, 1996; Neylon et al 2017). This requires involving multiple actors in the research system who are committed and are willing to coordinate. Research funders are a particularly crucial part of this, both because they often have more freedom of movement than other actors and their influence can exert on other actors in research systems, for example requiring certain policies or practices to be adopted as a condition of funding (Terry, Littler, & Olliaro, 2018).

In addition, Felt (2017) stated: *"that cultural shifts may include the creation of a research-attuned culture among decision-makers and a decision-relevant culture among project leaders".* It should facilitate the ongoing use of research knowledge in decision-making, such as the creation of a research-attuned culture among project leaders (Felt 2017; Neylon 2017). Creating the most appropriate generic measure of the future impact of research must be seen as an important part of the project. As well as facilitating the ongoing use of research knowledge to inform decision-making.

Importantly, bringing a cultural shift both in project leaders also known as researchers and in the health departments of the funder is essential. Since most project leaders think of the funder as a party who just provides money instead of a party who facilitates and steers them with their experience. The culture about the perspective on funder has to change as well. Which will eventually help in a relationship-building between the two parties and eventually creating a better impact.

5.6 Limitations of this research

One of the limitations was the unavailable documents for certain projects. Since most completed projects date a few years back, it was different to obtain all the needed documents. This resulted in excluding them from the analyses. In the end, this was not a problem as there was enough data to provide propositions. Further, ZonMw provided access to all these documents, which can have created a possible bias. However, the several selection criteria mentioned in chapter 3 limited this and ensured heterogeneity in the documents. Nevertheless, without ZonMw, the document would not be available which was necessary for this research.

In addition, the project leaders were not always approachable for the interviews. Many of the project leaders are health professionals with busy schedules, therefore time is very valuable for them. A few project leaders did not reply to the invitation of the interview, which potentially decreased the heterogeneity of interviewees. Still, the ones who did were sufficient for the data analysis. Further, the choice of interviewees for ZonMw aimed at actors who were most likely to be involved in the implementation process of projects. It was difficult to make a selection due to the fact that multiple employees at ZonMw are linked to one project. The most prominent staff members involved in the different phases of the project were interviewed.

Moreover, the COVID-19 pandemic made it impossible to conduct the interviews face-to-face. This might have led to a decrease in interaction with the interviewees. Therefore, a condition for the interviews was to have the camera on to have a degree of interaction. Further, the interviews had to be translated to English as they were conducted in Dutch. This could have influenced the interpretation of data. However, a member check was performed in order to decrease this issue. Likewise, a member check was used to ensure that their quotes have been interpreted correctly. This contributed to the triangulation of this study. Since, there is only one researcher who conducted the research, a concern for triangulation was present. This included the lack of another perspective. It was limited by using both data from the documents and interviews. As of last, there was supervision provided throughout the process of writing this thesis by two acknowledged researchers.

This research used an exploratory approach in studying the roles and perceived responsibilities of funders regarding implementation in research projects, as these issues were considered fairly new to many funders in literature. Therefore, it was not considered appropriate to send a questionnaire to all clinical research funders who could have opened up to quantitative analysis. An alternative method could be obtaining an in-depth study of research funders in the Netherlands, using a representative sample for resources and geographic scope. This method could have been performed, but would not have provided a representative picture of the Dutch research funder. Instead, it was chosen to capture the mechanisms and roles of all actors involved (funders, actors responsible for implementation, and executors) and their perception of their own role and that of the funders. Hereby, focusing on the role of funders and other actors in action.

5.7 Implications

First, a limited amount of research is carried out on how the limited time span in projects can influence an ongoing process such as creating impact. Especially, the role of the funder in this issue is almost not known. In this study, it was found that the funder can definitely play a key role in motivating the project to create impact beyond the project. However, this could be extended by including the opinion of several other funders about projectification. Likewise, there should be investigated what form of research might be the best one to obtain the optimal creation of impact. This could of be in the form of research where the knowledge extension phase is considered to be a part of the project. So, implementation of the results would be the last step in completing the research.

Second, another implication of this research would be to include professional associations. They are an important key actor in the process of creating impact. Many interviewees noted them as the responsible party for implementing the results. Since professionals associations were not included in this research, there could not have known whether they agree with this statement. These professional associations have the authority to create or adjust policies within their field (Dickson & Arcodia, 2010; Shaw, 2014). Since the professional associations consist of health professionals who have a busy schedule it is important to know their willingness to take on this responsibility. Further, other actors linked in the process of creating impact could be involved to know how they perceive their role. An example is the health insurers, they might not have such a prominent role in creating impact but can ensure a contribution to impact according to Boonen, L., & Schut, F. (2011).

Although this paper performed a case study, certain implications for this specific funder can be interesting for other funders as well. This study implies that the research funder should make it more clear why creating impact before, during, and after a project is so important. This could prevent the formation of a compliance culture. However, in order to really understand this subject, a follow-up study could be performed to know the compliance culture is perceived by the different actors in research projects. It will be difficult because it is not known whether the actors are open to talk about this matter and are truthful in their answers. Insights into these barriers and facilitating practices will contribute to the literature on the science culture and might serve as a theoretical foundation for future studies to build upon.

Furthermore, the research funder could on providing examples which is very much appreciated by project leaders. An improvement could be to display a good example of a completed application form on the website. In this way, the project group has an example of the extent to which he is expected to write about impact. Further, the research funder would like to see a more detailed plan that is aligned with different stakeholders but they also understand that the intended impact is a forecast. Since health planning in relation to creating impact has not been investigated thoroughly in research projects of rational pharmacotherapy, it may be an interesting subject to look into. Although general health planning was not a successful matter in the healthcare sector abroad, it might be interesting to see if projects in the Netherlands might be interested in health planning related to creating impact.

5.8 Conclusion

In this study, an answer is provided on what is the role of funders, in this case ZonMw, in the creation of impact in completed ABR research projects of rational pharmacotherapy.

There is huge diversity amongst projects, project leaders, and project groups within research and amongst funders more generally. This makes drawing general conclusions very challenging. There is a variety not just in capacities, network access, and access to resources and especially human resources e.g. implementation experts. But also in research models, underlying values, and ways of thinking about research in both funders and project leaders. This makes it more complex to align with the needs of the many actors involved in creating impact. Still, any strict requirement needs to reflect this diversity and provide the diverse support and resources that can help project groups to deliver on those requirements.

Several roles of the funder were outlined in the three phases. First, the formulation phase illustrated that the role of the funder is to be approachable and more attentive in fulfilling the needs of the project leaders. In addition, the authoritative role is seen in how the research funder creates conditions for creating impact through legislation in implementation. Second, the role of the funder during the project, the production phase, is encouraging, motivating, and stimulating the project group to create impact. The funder tries to attend on how the project group can already inform certain stakeholders about their projects or how they could perform certain steps that will be beneficial. Third, in the knowledge extension phase, the funder can contribute to impact beyond the research project. The research funder should take upon the role of creating interaction between researchers and research users and disseminate the research results. In addition, it should consist of the funder communicating to decision-makers that implementation is important and trying to persuade decision-makers to invest in implementation i.e. advocating the use of research results. In this step of the project, a shortcoming was identified in the case study, ZonMw. Nonetheless, they are open to inform the designated party and perform the first step in ensuring the implementation of the results. Further, ZonMw lacks in monitoring the implementation results in practice. They did not illustrate this role with specific activities and therefore it can be a potential role that the funder should fulfil. Still, ZonMw has taken the lead in providing a good example for other funders in creating impact. They carry out multiple activities to improve their role as a funder.

What becomes clear from this research, is those with responsibility for creating impact need to be a team, including research funders, project groups, and health professionals working together. The relationship between a funder and project group can be improved by having higher trust and flexibility between both parties. Achieving better impact creation and ultimately improved healthcare, therefore, requires a more proactive approach from both the research funder and the project group. Still, there is not one party accountable for implementing the results. However, the most common answers appointed the professional associations as the best possible party. There is limited literature on what the role of professional associations can be in creating impact from research projects. Therefore, follow-up research could be to include the role of several professional associations to explore the willingness on the responsibility of implementing research results.

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Appendix I

The presented table shows the delineations of the many contributions created by the project group. The contributions are divided in three main categories: scientific, direct and other according to Contribution Mapping. The four areas from ZIAF are merged in the three mentioned categories. The products and activities are based on the documentation of the projects.

Category	Group		
Contributions	Scientific contributions	**Areas**	**Products & Activity**
		Research	Products: • Article trade journal/magazine • Article wide audience • Book for a wide audience • Conference • Code • Decision support • Decision aid E-health / app • Dissertation • Infrastructure/knowledge square • Intervention • Knowledge agenda • Knowledge synthesis • Movie • Newsletter/message, press release • Poster • Presentation/lecture • Protocol • Report • Scientific book • Software • Website Activities: • Meetings • Informing • Social media • Distribution of materials
	Direct contributions	Policy	Products: • Cost evaluation/BIA/business case • Knowledge agenda • Knowledge synthesis • Movie

			• Newsletter/message, press release • Policy Report • Report Activities: • Meetings • Informing • Distribution of materials
		Education	Products: • Education module/training/E-learning/MOOC • Movie • Newsletter • Poster Activity: • Educational Meetings • E-learning • InterVision • Presentation • Provide training/education
		Practice	Activities: - Management: • Chain care • Communication • Data management • Improvement team • Stakeholder Quality Cycles • Work processes - Patiënt gericht: • Cooperation decision-making • Choice aid • Measure patient experiences • Promote adherence • Promote self-management - Commercial • Business development/spin-off • Contract • Patent/patent • Production line

	Other contributions	Motivating/support increasing	- Personal contact - Meeting - Key figures/opinion leaders - Intercollegiate contact - Stakeholder support group - Feedback meeting/observation - Reminders
		Product development	- Need assessment relevant stakeholders - Investing product development - Intermediate products
		Market oriented	- Quality mark - Image/position with numbers/advertising - Renewal Fee - Financial guarantee
		Facilitating	- Improvement skills/ project management skills - Project management - Secondment (content) and advice - Match making - Guideline - Choice help
		Stakeholders	- Stakeholders in project group - User council/patient panel - Consultation with relevant stakeholders - Knowledge demand from relevant stakeholders - Co-creation with relevant stakeholders - Match-making

Samenwerking (engagement)	Stakeholders Internal	• Practice (prevention/cure/care/welfare) • Policy (local/regional/national/international) • Research/science • Education • Patients/citizens • Business • Health insurers
	Stakeholders External	• Practice (prevention/cure/care/well-being) • Policy parties • Research/science • Hospitals • Universities • Patients/citizens • Professionial associations

Funding	Funding by ZonMw	Project financing ZonMw
	Co- funding	• Cash contribution • Kind contribution • Combination contribution
	Contributed parties	• Hospitals • Pharmaceutical companies
	Follow-up funding	• Continuation of funding ZonMw • Continuing financing differently • Continuation of financing combination

Appendix II

All the available documents for each project are presented in the table. A total of 89 documents were analysed with the document displayed in appendix III.

Type of project	**Project number & Interviewee**	**Available documents**	
Applied research	***Project I – I1***	Call text: GGG open round 3	D1
		Project idea (PI)	D2
		Recommendation on PI	D3
		Detailed application	D4
		Supplement detailed application	D5
		Rebuttal on reviewers comments	D6
		Letter of approval	D7
		Progress report	D8
		Short version progress report	D9
		Memo progress report	D10
		Final report	D11
Development project	***Project 2 – I2***	Call text: DO round	D12
		Recommendation on PI	D13
		Detailed application	D14
		Rebuttal on reviewers comments	D15
		Letter of approval	D16
		Progress report	D17
		Extra progress report	D18
		Memo progress report	D19
		Final report	D20
		Memo final report	D21
Applied research	***Project 3 – I3***	Project idea (PI)	D22
		Recommendation on PI	D23
		Detailed application	D24
		Rebuttal on reviewers comments	D25
		Letter of approval	D26
		Progress report	D27

		Supplement questions progress report	D28
		Memo progress report	D29
		Final report	D30
Applied research	***Project 4 – I4 & I5***	Project idea (PI)	D31
		Recommendation on PI	D32
		Detailed application	D33
		Rebuttal on reviewers comments	D34
		Letter of approval	D35
		Progress report	D36
		Supplement questions progress report	D37
		Memo progress report	D38
		Final report	D39
Implementation project	***Project 5***	Project idea (PI)	D40
		Recommendation on PI	D41
		Detailed application	D42
		Rebuttal on reviewers comments	D43
		Letter of approval	D44
		Progress report	D45
		Extra progress report	D46
		Memo progress report	D47
		Final report	D48
		Memo final report	D49
Applied research	***Project 6***	Call text: GGG open round 1	D50
		Project idea (PI)	D51
		Recommendation on PI	D52
		Detailed application	D53
		Rebuttal on reviewers comments	D54
		Letter of approval	D55
		Progress report	D56
		Memo progress report	D57
		Final report	D58

		Feedback final report	D59
	Project 7	Project idea (PI)	D60
		Recommendation on PI	D61
		Detailed application	D62
		Rebuttal on reviewers comments	D63
		Letter of approval	D64
		Progress report	D65
		Intern memo progress report	D66
		Final report	D67
		Final stop report	D68
Applied research	***Project 8***	Call text: GGG open round 4	D69
		Project idea (PI)	D70
		Recommendation on PI	D71
		Detailed application	D72
		Rebuttal on reviewers comments	D73
		Letter of approval	D74
		Progress report	D75
		Extra progress report	D76
		Memo progress report	D77
		Final report	D78
		Supplement final report	D79
Applied research	***Project 9***	Call text: GGG open round 2	D80
		Project idea	D81
		Recommendation on PI	D82
		Detailed application	D83
		Rebuttal on reviewers comments	D84
		Letter of approval	D85
		Progress report	D86
		Extra progress report	D87
		Memo progress report	D88
		Final report	D89

Appendix III

Contribution Mapping – Project analysis

Title of study	
Case-study reference (project number)	
Applicant (if differs from PL) I. Name II. Formal function III. Mail address	
Project leader I. Name II. Formal function III. Mail address	
Organisation/Department	

1. Overview

1.1 Study description (as written in the project idea)

1.2 Researchers, their function and organizations involved (provide the whole team)
Project leader:
Other investigators:

1.3 Linkage to organisations

a. Is there linkage between the project leader/PI and the funder? Did the parties have contact in the past?

1.4 Funding sources

a. How much funding was given to the project groups? *(= letter of honour)*
b. What were the additional requirements of the funder? *(= letter of honour)*
c. Was there a co-financer? If so, how much budget was allocated and who was the co-financer?
d. Which implementation activities are going to be funded? *(= detailed application/ letter of honour*

2. Formulation phase/Subsidy process

start: & end:
This phase starts when the researchers first come up with the idea of the study (submission of project proposal) and ends when the grant is awarded by the funder.

2.1 Origin of the research idea

a. Where does the idea for this study came from?
b. Why was the study was started?

2.1.1 Intended impact

a. How does the project group formulate creating impact?
b. How does the project group want to achieve the creation of impact?
    a. Which steps do they want to take during the project?
        i. Products

ii. Activities

c. Within which timeframe does the project group want to achieve impact?

2.1.2 Role of the funder

a. How does the funder want to see the creation of impact? (=call text)
b. How did the committee respond to creating impact described in the project idea? (=Adviesbrief)
c. Does the project group have any explicit expectations regarding creating impact for the funder mentioned?

2.2 Contributions - Which contributions are planned? (long/short term)

2.2.1 Scientific contributions

a. Provide a description of scientific contributions
  I. for instance: publications or can the results of this research project be translated into recommendations that are suited for the policy field?
b. In which practice (research, policy, education or practice) are the contributions planned?

2.2.2 Direct contributions

a. Provide a description of direct contributions (= decisions taken directly on the basis of the research findings)
  I. for instance to the study participants or new treatment that immediately becomes standard care on the basis of the research results.
b. In which practice are the contributions planned?

2.2.3 Other potential contributions of the knowledge to action
Daarbij gaat het om ongeplande bijvangst, zoals onverwachte resultaten die bijdragen aan een ander project of die geextrapoleerd kunnen worden naar een andere patientenpopulatie, onvwerwachte samenwerkingen die in de toekomst worden voortgezet.

a. Description of other contributions, it may be that these are aimed for but have not yet been achieved
b. In which practice are the contributions planned?

2.3 Fit with external information needs

Describe whether and how the study was attached to evidence priorities or research needs. This means whether the party which has a role in practice had a very clear wish or priority (like the antibiotic program was set up due to the priority it was given by the government). Sometimes this is very explicit and researchers simply know what the 'priorities' or 'needs' were. In other cases the more implicit: eg researchers who themselves think this is an important topic.

a. To what extent was this research linked to a clear research priority or agenda of a practice partner

2.3.1 Engagement during the formulation

a. Who did the researchers engage with when making plans to start this study (e.g. when writing the protocol) or who are they planning to engage with during the study?
b. How and why did the project group engage with a certain party?

Notes

a. Which steps are not mentioned according to me?
b. What stands out to me?

3. Conduct phase

start: & end:

This phase starts after the protocol has been approved which means the grant is awarded by the funder. It ends when the final results have been determined and the end report is accepted and approved of by the funder.

Progress reports

3.1 Main findings - progress on creating impact

a. Are there any alterations in the steps mentioned in the grant application?
b. Is the provided timeframe still achievable?

3.1.3 Role of the funder

a. Was their guidance in creating from the funder during the study? (Memo)

b. Has the funder motivated the project group in taking steps in achieving long term impact during the study?

c. How often was and will there be contact with the project leader / group?

3.2 Contributions - Progress on planned contributions

3.2.1 Scientific contributions

a. Which contributions are already done?
b. Which steps are already taken in achieving the formulated impact?

3.2.2 Direct contributions

c. Which contributions are already done?
d. Which steps are already taken in achieving the formulated impact?

3.2.3 Other potential contributions of the knowledge to action

e. Which contributions are already done?
f. Which steps are already taken in achieving the formulated impact?

3.3 Engagement during the project

a. Describe who the researchers engaged with while the study was conducting?
b. How did the project group engage with a certain party?

End report

3.4 Role of the funder

a. Did the funder meet the expectations mentioned by the project group?

b. Was their guidance from the funder during the study? (Memo)

c. Did the funder motivated the project group to take steps in achieving long term implact?

i. For instance, offering VIMP

d. How often was there contact with the project leader / group?

3.5 Contributions - which contributions are eventually achieved at the moment of this analysis?

3.5.1 Scientific contributions

a. Which contributions are achieved?
    a. How was the funder involved in the achievements?

        b. In which practice (research, policy, education or practice) are the contributions achieved?
    b. Which steps did they take in achieving the formulated impact?

3.5.2 Direct contributions

a. Which contributions are achieved?
    a. How was the funder involved in the achievements?
    b. In which practice (research, policy, education or practice) are the contributions achieved?
b. Which steps did they take in achieving the formulated impact?

3.5.3 Other potential contributions of the knowledge to action

a. Which contributions are achieved?
    a. How was the funder involved in the achievements?
    b. In which practice (research, policy, education or practice) are the contributions achieved?
b. Which steps did they take in achieving the formulated impact?

3.5.4 Deviations

a. Which deviations can be found in the steps (of creating impact) which are truly taken compared to the steps which were intended?
    a. How was the funder involved in the deviations?

3.6 Verification of the engagement during the study

a. Who did the researchers engage with during the entire study?
    i. Did the funder guided the project group into specific actors? If so, how?

3.7 Context and climate

a. Describe whether there were things beyond the direct study that either enabled or constrained in creating impact.
b. What are the things in the country's research climate that enable or constrain use of research?

Notes

a. Which steps are not mentioned according to me?
b. What stands out to me?

4. Utilisation phase / After the project

start: & end:

This phase starts after the final results have been determined and the end report has been accepted and approved by the funder. This phase does not always have a clear end, since impact is ongoing process.

4.1 Usage of main findings

4.1.1 Internal

a. Describe if, how and by whom the main findings of the study will be used internally (= colleagues who use findings for a new research or article, a newsletter, a report for the department / section / faculty)

4.1.2 External

b. Describe if and how and by whom the main findings of the study will be used externally (= actors outside the direct colleagues / department)

4.1.3 Role of the funder

a. How will the funder motivate the project group to take steps in achieving long term impact?

    i. For instance, offering VIMP

b. How often will there be contact with the project leader / group?

4.2 Contributions - which contributions are eventually achieved at the moment of this analysis?

4.2.1 Scientific contributions

c. What are they aiming for creating long term impact?

4.2.2 Direct contributions

a. What are they aiming for creating long term for impact?

4.2.3 Other potential contributions of the knowledge to action

b. What are they aiming for creating long term for impact?

4.3 Planned engagement after the study

a. Who are they aiming to contact for creating long term impact?
b. Does this corresponds to what they mentioned in the subsidy process/project idea?

5. Scenarios

a. Has the intended impact after the project been achieved according to the project group?
    a. If not, what does the project group think should happen for creating impact (apart from what has been achieved) on (long term) impact?
b. Who does the project group think should play a role in creating impact?
    a. Also describe whether these actors actually will use the results (their expectations)?

Notes

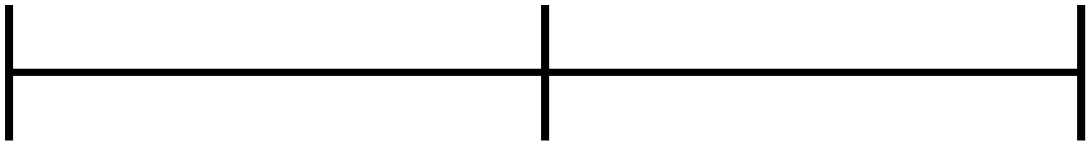
a. Which steps are not mentioned according to me?
b. What stands out to me?

7. Remaining questions

a. Remaining questions about this project that need to be clarified

8. Timeline

What happened when during the course of the research project?



Appendix IV

An overview of all the interviewees with their function.

Reference number	*Function*
I1	Project leader – Trauma surgeon
I2	Project leader – Hospital pharmacist
I3	Project leader – Hospital pharmacist
I4	Project leader – Internist infectiologist
I5	Phd student
I6	Staff member of ZonMw – program manager
I7	Staff member of ZonMw – implementation specialist
I8	Staff member of ZonMw – head of cluster rational pharmacotherapy
I9	Staff member of ZonMw – implementation specialist
I10	Staff member of ZonMw – staff member of strategy and innovation

Appendix V

Introduction

Welcome to this interview, my name is Priya Somai and I am currently doing my research in Health Economics, Policy, and Law at Erasmus in collaboration with ZonMw cluster Good use of medicines (GGG). In doing so, we map the impact of research projects in the field of the correct use of antibiotics. Impact in practice means for this research that (relevant) research results are translated into research, policy, education and/or healthcare practice. Impact can be created during and after a project. Most documentation is created during the project and stops after the last evaluation. In order to know the impact and further development of knowledge in antibiotic research, interviews are conducted on the basis of the document analysis. The interviews will focus on the long-term impact of a project after it has been completed, as this is most likely not documented. This provides insight and knowledge about how impact occurs during and after the project. The financier also plays an important role in creating impact. They can motivate the project by formulating or already taking steps in creating impact. Their role will therefore be of great importance during the interviews.

The interviews consist of two parts: during and after the project. First, the interview discusses how the project group creates impact during the project and how the financier has guided the project group in creating impact. Then questions will be asked about creating impact after the project and how involved the role of the funder was in the process by directly motivating the project group or by presenting results, funding VIMP, etc.

Consent/Privacy

The interviews will last approximately 45 minutes with project leaders of the selected projects. These interviews are only recorded with your permission. The recordings themselves are stored in the university data regulations with a secure university disk. The recording is then transcribed anonymously. The transcripts can be shared with ZonMw if you explicitly allow it, as your privacy is of great value. Do I have your permission to record this conversation? Then I would be happy to go through the consent form with you.

Warming-up & central opening question

Your project - and that of several others - has been selected for this research to gain insight into creating impact on projects of correct use of antibiotics. The available documents on the progress and results of your project have been analysed. I would like to supplement this data with current information and developments regarding your project. To understand the current situation, could you first explain your role within the project and what your responsibilities were?

End general part. Hereafter follow two specialized topic lists.

Topic List Project leader

Case-study reference:	
Title of study:	
Name of Interviewee:	
Location of the interview:	
Date of interview:	
Function of interviewer:	
Organisation / depart.	
Mail address	
Phone number of interviewer	

General steps before interview:

1. *Thank the PL for his/her time and hospitality*
2. *Introduce yourself*
3. *Introduce the purpose of the interview*
4. *Ask for permission to record the interview*
5. *Test the tape recorder*
6. *Turn on the tape recorder*

1. Intended impact

Impact created during the project - First, the interview discusses how impact is created during the project and how the funder influenced the project group in creating impact.

1.1.1 a. How did you work on creating impact during the project?
(guideline adapted by International societies such as the Dutch Association of Surgery and this will ensure a broad implementation in practice; this can therefore be already bringing stakeholders together or contacting those parties that are important for adapting the guideline)

b. In your opinion (project group) has the intended impact (as described in the UA (detailed application) been achieved?
1. If so, are you satisfied with the way this has been achieved or would you like to make changes now?

1.2 Role of the project group

a. What is your definition of creating impact?
b. How important was creating impact during the project?
c. What did you as a project group do to create impact during the project?
d. Do you see creating impact as a (continuous) result of the project?

1.3 Role of the funder

a. How important was/is the financier in creating impact?
b. What were the project group's expectations for the financier in creating impact during the project?
c. Has the financier guided you (in any way) in creating impact?
d. How did you experience the impact requirements at the start of the project?
    a. Were they clear to you?
    b. Were the requirements meaningful, important and useful?
    c. How did you approach these requirements and?
        i. How important are well-defined requirements for creating impact to you?
e. Were there sufficient contact moments with the financier for your project? Would you have liked more?
f. What do you think the financier should do in guiding the project group in creating impact in general? / How should the financier guide the project group in creating impact during the project?
    a. What do you think ZonMw should do in this area?
    b. What improvements do you have for ZonMw in the process of creating impact?
        i. Does this mean more contact between financier and project group?
        ii. Is one of the comments a clearer description of how the financier wants to see creating impact?

2. Impact beyond project

Impact formulated to be achieved after the project - Questions will be about creating impact after the project and how involved the role of the funder was.

2.1 a. Is In your opinion (project group) is the intended long-term impact after completion of the project?

i. If so, how was this achieved?

b. Has the impact mentioned above been communicated to ZonMw?

i. Why or not?

ii. Do you find it necessary/important/useful to report the achieved impact to ZonMw after the project?

c. What was the reason for completing the VIMP?

i. If not, would you now (looking back at the project) consider completing the VIMP?

ii. How important do you think the VIMP was?

iii. Do you think the VIMP is a good tool to motivate the project group to implement their results in practice?

iv. Do you think that the VIMP pays less attention to creating impact?

d. Would you like to work with ZonMw again? Why or not?

2.2 Role of the project group

a. How important is creating impact for the project group after the project?
b. Are there any improvements in creating impact that you would like when you look back on the project? / Would you do it differently in terms of creating impact?
c. How did you achieve the formulated impact outside the project?
d. Do you consider it your duty to ensure the implementation of the results at the end of the project?
    a. If not, who should do it?

2.2 Role of the funder

a. To what extent was/is the financier important in creating impact that can be achieved after the project?
    i. Looking back, how important do you think it is already at the time of the project to work towards impact?
b. What were the project group's expectations for the financier in creating impact after the project?
c. Has the financier motivated the project group to take steps to achieve long-term impact?
d. What do you think the financier can do to stimulate the creation of impact after the project?
e. How do you think the funder could improve from what they are already doing to encourage the project group after the project to create impact?

Topic list ZonMw staff members

1. Creating impact

a. Rol van de financier

1. What is your definition of creating impact?
2. What do you think is the role of the financier in this?
3. To what extent was/is the financier important in creating impact that can be achieved during and after the project?
4. Who do you think is responsible for implementing the results after the project is over?
5. What do you think you as a GGG are already doing to create impact? (website, conference, what else?)
6. What do you think is going well in guiding the project group in creating impact?
    a. And less well?
7. Do you think the requirements in the call text are clear enough?
    a. Why yes or no?
8. I saw in the document that the committee members gave feedback on impact, of how much value is this?

b. Relationship funder and project leader

1. Can you describe your own experiences with regard to (facilitating) the relationship between the project leader and the financier?
2. Do you consider it the duty of the project group to ensure the implementation of the results after the project?
3. Do you think there is more need for contact between the project group and ZonMw from the perspective of the financier? And from the project group?
4. What do you think is the role of the project leader and the project group

2. VIMP

1. Do you think the VIMP adds value to the project, how important do you think the VIMP is? Have you ever asked a project manager what they think?
2. How important do you think the VIMP was/is?
3. Do you think the VIMP is a good tool to motivate the project group to implement their results in practice?
4. Do you think that the VIMP pays less attention to creating impact?

The following questions were asked to all interviewees

3. Scenarios

It is about the difference that what is already going on now and things will improve in the future.

1. What does perfect guidance from the financier look like in your opinion? During and after the project?
2. How is it checked that the results are incorporated in practice?
3. What do you think the financier can improve in terms of guiding the projects to create impact?
4. What do you think of the idea of drawing up a plan with the funder before the project to create impact during and after the project?
5. What do you think of an implementation expert before and after the project?

The end

I would like to thank you for having this interview with me and providing all the necessary answers for my research. (If anything is unclear to me - There is still... unclear to me, can you elaborate?).

If you have any questions for me, I'll be happy to answer them. If not, I would like to thank you again and wish you a very nice day.

Appendix VI

The following document was used to organize and code all the transcripted interviews in Atlas.ti.

Groups

- Interviews
  - ZonMw
    - Functies:
      - Senior program manager + adviser implementation GGG
      - Implementation expert (Kris)
  - Projectleaders
    - Female
    - Male
    - Function
      - Internist infectiologist: 836021001
      - professor and head of infectious diseases
      - trauma surgeon: 836031005
      - pediatrician
      - hospital pharmacist: 836041004, 836021008
    - Location:
      - > AMC
      - > LUMC
      - > GELRE: 836021008
      - > ERASMUS MC
      - > HMC

Coding projectleaders

- ACHIEVED IMPACT
  - Achieved impact: In project
    - Achieved impact: In project: creating awareness
  - Achieved impact: After project
    - Achieved impact: After project: guidelines take too long
    - Achieved impact: After project: guidelines take not too long
    - Achieved impact: After project: creating awareness (in the form of knowledge products)
    - Achieved impact: After project: follow-up study
    - Achieved impact: After project: unpredictable
- CALL TEXT
  - Call text: Clear
  - Call text: not clear
- Collaborations
  - Collab: A-teams
  - Collab: SWAB
  - Collab: stichting werkgroep antibiotica
  - Collab: patients
  - Collab: GP
  - Collab: hospitals
- **CULTURE SWITCH**
  - Culture switch: perspective (funder not only for money)
  - Culture switch: project group deliver what promised
  - Culture switch: project group put the first step

    - Culture switch: collab between researchers (instead of researchers having rivalry)
- DEFINITION IMPACT
    - Definition impact: Improvement daily healthcare → social impact
    - Definition impact: creating awareness → scientific impact
- RELATIONSHIP FUNDER & PROJECTLEADER
    - Relationship funder & projectleader: steering of funder
    - Relationship funder & projectleader: more contact
    - Relationship funder & projectleader: contact ok
    - Relationship funder & projectleader: less contact
    - Relationship funder & projectleader: **trust**
    - Relationship funder & projectleader: flexibility
    - Relationship funder & projectleader: laagdrempelig contact
- RESPONSIBILITY
    - Responsibility: who should implement results? (WSIR)
    - Responsibility: WSIR: hospitals
    - Responsibility: WSIR: not funder
    - Responsibility: WSIR: project leader
    - Responsibility: WSIR: not project leader
    - Responsibility: WSIR: Professional associations
    - Responsibility: WSIR: university
    - Responsibility: WSIR: implementation project (another project group)
- ROLE OF THE FUNDER
    - Role of the funder: steering
    - Role of funder: (providing) contacts (between different parties)
    - Role of the funder: cant help
    - Role of the funder: (should stay)within limits
    - Role of the funder: giving acknowledgement
- ROLE OF Project leader (PL)
    - Role of PL: only research
    - Role of PL: own contacts (within the field)
    - Role of PL: no time
- SCENARIO'S
    - Scenario's: meeting
        - Scenario's: meeting: want meeting before project
        - Scenario's: meeting: don't want meeting before project
        - Scenario's: meeting: want meeting after project
        - Scenario's: meeting: don't want meeting after project
    - Scenario's: implementation expert
        - Scenario's: implementation expert: want implementation expert
        - Scenario's: implementation expert: don't want implementation expert
- VIMP
    - Vimp: Pos
    - Vimp: Neg
    - Vimp: no clue

        → can use sentiment analysis
- ZONMW EXPERIENCE
    - ZonMw experience: Pos
    - ZonMw experience: Neg
    - ZonMw experience: paperwork
    - ZonMw experience: more brand awareness

Codes ZonMw's staff members

- CALL TEXT
  - Call text: Clear
  - Call text: not clear
- **CULTURE SWITCH**
  - Culture switch: perspective (funder not only for money)
  - Culture switch: project group deliver what promised
  - Culture switch: project group put the first step
  - Culture switch: collab between researchers (instead of researchers being rivals)
- DEFINITION IMPACT
  - Definition impact: Improvement daily healthcare → maatschappelijk impact
  - Definition impact: creating awareness → wetenschappelijk impact
- IMPROVEMENTS
  - Improvements: more contact
    - Improvements: more contact: ideally
    - Improvements: more contact: not practical/no capacity
  - Improvements: more accessible/approachable
- RELATIONSHIP FUNDER & PROJECTLEADER
  - Relationship funder & projectleader: steering of funder
  - Relationship funder & projectleader: **trust**
  - Relationship funder & projectleader: flexibility
- RESPONSIBILITY
  - Responsibility: who should implement results? (WSIR)
  - Responsibility: WSIR: hospitals
  - Responsibility: WSIR: not funder
  - Responsibility: WSIR: project leader
  - Responsibility: WSIR: not project leader
  - Responsibility: WSIR: Professional associations
  - Responsibility: WSIR: university
  - Responsibility: WSIR: implementation project (another project group)
- ROLE OF THE FUNDER
  - Role of the funder: steering
  - Role of funder: (providing) contacts (between different parties)
  - Role of the funder: cant help
  - Role of the funder: (should stay)within limits
  - Role of the funder: giving ackowledgement
- ROLE OF Project leader (PL)
  - Role of PL: only research
  - Role of PL: own contacts (within the field)
  - Role of PL: no time
- SCENARIO'S
  - Scenario's: meeting
    - Scenario's: meeting: want meeting before project
    - Scenario's: meeting: don't want meeting before project
    - Scenario's: meeting: want meeting after project
    - Scenario's: meeting: don't want meeting after project
  - Scenario's: implementation expert
    - Scenario's: implementation expert: want implementation expert
    - Scenario's: implementation expert: don't want implementation expert
- VIMP

    - Vimp: Pos
    - Vimp: Neg
- WRAP
- ZONMW: vision
- ABR specific