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Evaluation of WWTF COVID-19 Rapid Response Call

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Katharina Warta, Tobias Dudenbostel, Mona Pöschko

This English version of the text is based on machine translation and approved by the authors of the study.

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Executive Summary

The Vienna Science and Technology Fund (WWTF) has commissioned Technopolis Austria to evaluate the COVID-19 Rapid Response Call. The evaluation looks at the process, implementation, results, and impact of the Call and formulates formative conclusions and recommendations, in particular on the extent to which lessons can be drawn from the experience with the COVID-19 Rapid Response Call for other programmes and processes of the WWTF or other funding organisations. The evaluation was conducted between April 2023 and November 2023 and is based on document analysis, in particular coded project final reports, a self-assessment report by the WWTF, a network analysis of collaborations, a focus group with representatives of funded projects, as well as interviews with applicants, jury members, and various stakeholders. We also provide an overview of international experience with comparable programmes.

The COVID-19 response Call at a glance

In March 2020, immediately after the Austrian federal government imposed the first movement and contact restrictions ("lockdown") due to the COVID-19 pandemic, **WWTF decided to provide funding for research projects in a very flexible way to meet the urgency of the situation.** The aim of this Call was to support data collection for research and related activities during the unexpected COVID crisis in spring 2020. Appropriate data to capture the situation was often not available. As crises often develop very quickly, relevant knowledge is often fleeting and cannot be reproduced at a later stage. The Call therefore focused on rapid action for data driven research in the fields of health, society and economics. The Call was conducted as an "Additional Funding Measure" in accordance with WWTF guidelines.

An important element in the **design of this Call** was the **limited nature of the Call**: The heads of universities and research institutions were invited to submit a limited number of projects (between one and three, depending on the size of the organisation). The implementation of the Call took only ten days – from the written invitation, pre-selection by rectorates/institute heads, submission, evaluation, and funding recommendation by a jury of six stakeholders and experts, to the circular decision by the Board of Directors and the signing of the contract already on 1 April. WWTF received a total of **41 applications** from Viennese research institutions and universities, of which 38 were sent for evaluation after a formal review. **WWTF funded 24 of these applications**, many of which received funding of around € 50,000, four were somewhat smaller with funding of less than € 25,000. Funded projects were often embedded in longer research trajectories and larger project portfolios led by established researchers. This is reflected, for example, in the fact that the projects were able to demonstrate an average of 68% own contribution (i.e. twice the required 35%). Of the 24 project leaders, five were women.

Results and impact of the Call

The **main added value of WWTF's COVID-19 Rapid Response Call** was that the funded researchers were able to **quickly** carry out research on relevant topics through a project on an institutionalized ground. An earlier start increased the impact both at the scientific level (publication success) and at the political and societal level (visibility and early provision of action-oriented data).

The direct results of the COVID-19 Rapid Response Call were **83 publications directly related to the funding**, of which 53 were peer-reviewed and 54 open access publications. In addition, 19 indirect publications were recorded, of which 15 were peer-reviewed. Furthermore, **40 new academic collaborations** were established, eleven international and three national. **23**

projects reported at least one successful follow-up application. Three scientific career steps were recorded.

Many funded projects were able to make unusually high and rapid impact contributions, particularly in the area of pandemic management and control. Examples include contributions to the development and commercialization of **SARS-COV-2 antibody tests,** the successful launch of the "Alles Gurgelt" project in Vienna, where upscaling was supported, and **the development and implementation of the Corona traffic light system**, which was supported by several projects. WWTF-funding has also contributed to providing **decision-makers with information** on the course of the pandemic and the impact of measures taken on those affected, which has been incorporated into the Future Operations Clearing Board, among other things**.** From a scientific point of view, the projects had an advantage in the competition for scientific publications and citations because the results were available very early and the content of the first two waves of the coronavirus pandemic had already been taken into account. A major difference from other research projects was the **high level of media interest in the research projects** and the programme, which was generated comparatively quickly after the start of the project.

For many of the researchers involved, this funding experience was characterized by the impression of being able to make **an unusually large contribution to solving a very specific societal problem**, this had a strong mobilizing effect, which was also reflected in the target groups of the panel surveys. This was also associated with a heavy workload. Work that would normally take months was compressed into a few days or weeks. This happened at a time when the actual research work was sometimes made more difficult by the working conditions during the first lockdown, for example because one could no longer go to the office, or because closed schools and kindergartens had to be compensated for.

With this funding, WWTF has stabilized training paths during the crisis. Some young researchers reported a career boost thanks to the early publications that were made possible, which generated a high level of visibility. In other cases, qualification work was delayed.

From a project perspective, the **cooperation experiences,** and **resilient networks** for applying for follow-up research were a key outcome. In many cases, the funded projects were able to acquire additional funding, enter into new types of collaborations, including with non-scientific organisations, or were able to carry out multi-wave surveys beyond WWTF funding, even if these were not always secured for the long term.

Conclusions

Overall, the collected evidence reveals a **very positive picture** of WWTF's COVID-19 Rapid Response Call, with an extraordinarily high scientific and societal impact in terms of financial expenditure and speed. The call had a mobilizing effect on the Viennese research community because WWTF suddenly and quickly opened up scope for action. The central prerequisite for this is the specific constellation of WWTF - small, independent, a fund, trust capital accumulated over many years, good networking, and strategic expertise.

A **special feature of the Call** was the speed with which WWTF designed and implemented the Call, which was also made possible by the involvement of organisational leaders such as rectors in the pre-selection of projects. **The speed of the design and selection process** was key to the success of the funded projects, with contributions to societal impact and science being made more quickly and to a greater extent. **The objective** of enabling the rapid collection of data for research purposes **was thus achieved**. **WWTF has also taken the experience gained from the Call into account**, for example by making the format of the "Additional Funding Measures" even more flexible in 2021 and by increasing the maximum funding amount, which

has already been used for two other initiatives in the field of digital humanism, the funding of Ukrainian scientists in exile in Austria and the financial support of universities and research institutions in Vienna in the course of submitting an excellence cluster to the FWF. In addition, WWTF subsequently launched two new calls, in which the experience from the COVID-19 Rapid Response Call could be incorporated ("Empirical Social Sciences") or provided an impetus for it ("Public Health").

For many years, WWTF has been highly recognized and trusted by researchers and stakeholders for attracting and selecting high-quality research proposals and subsequently supporting their implementation. Against this background of extensive evaluation experience, an exception can be made to the procedure in the event of a crisis, in order to select projects quickly and still create sufficient legitimacy. With the COVID-19 Rapid Response Call at the latest, WWTF became a representative of "third generation research governance", which is oriented towards the impact of research on major societal challenges. However, unlike numerous programms in this field, it has clearly defined, concrete objectives that are reflected in the selection criteria and also facilitate the evaluation of impact and achievement of objectives.

Based on these observations, we make the following **recommendations:**

1. The selection process can be used as a model for comparable calls in an acute crisis.
2. In the interest of traceability and transparency, it is important to document the decision-making process - even if it is partly subjective due to the crisis - not only for the jury (that happened), but also for the funded organisations.
3. Efforts in other programms to diversify the field of established researchers should be continued in order to achieve a better gender balance in a possible next crisis.
4. Even without a specific crisis context, a flexible funding instrument for data collection could be set up to ensure the continuity of surveys and the coherence of work in collaborative networks.
5. In view of the interesting and diverse impact pathways, we recommend continuous monitoring of the people involved in the COVID-19 Rapid Response Call projects or the commissioning of a related research project.
6. In principle, the usual selection procedures should be maintained.
7. The activities of WWTF using "Additional Funding Measures" " should be communicated more proactively on the homepage in order to support the discourse on the engagement of research in relation to (current or pressing) societal problems.

1 Introduction

The Vienna Science and Technology Fund (WWTF) was founded in 2001 as a private and non-profit Vienna funding organisation (in the following, we will refer to WWTF as an RFO, Research Funding organisation), financed by the "AVZ Privatstiftung zur Verwaltung von Anteilsrechten", through funds from the City of Vienna and through private donations. Since its inception, WWTF has awarded over € 230 million to over 500 WWTF projects.[1] WWTF sees itself as a niche player and "establishes long-term thematic programms to strengthen the Viennese scientific community where it is necessary. Within these programms, there are regular calls for people and/or projects." The main funding instruments are scientific projects with a duration of up to four years. In addition, individual calls for proposals are also specifically dedicated to young top scientists. The principles of WWTF include evaluations dedicated to transparency and credibility, gender equality, which is specified in the Gender Equality Plan, good scientific practice in accordance with the guidelines of the Austrian Agency for Scientific Integrity (GWP guidelines of the OeAWI), the Open Science Policy of WWTF, as well as WWTF funding guidelines [1]. The mission of WWTF is also defined there.

Box 1 Mission of WWTF

WWTF is a persistent driver for inspiration in and for Vienna as a research location and a strong partner for its universities and research institutes to continuously increase the excellence and relevance of research.

We see it as our task to support outstanding research through our work in competitive research funding. Excellent scientific projects are selected according to strict criteria and high-quality processes. They receive substantial financial support from WWTF. The research is embedded in socially relevant questions through carefully planned priorities and active networking between disciplines and institutions. We want to make an important contribution to shaping a better world through science and research.

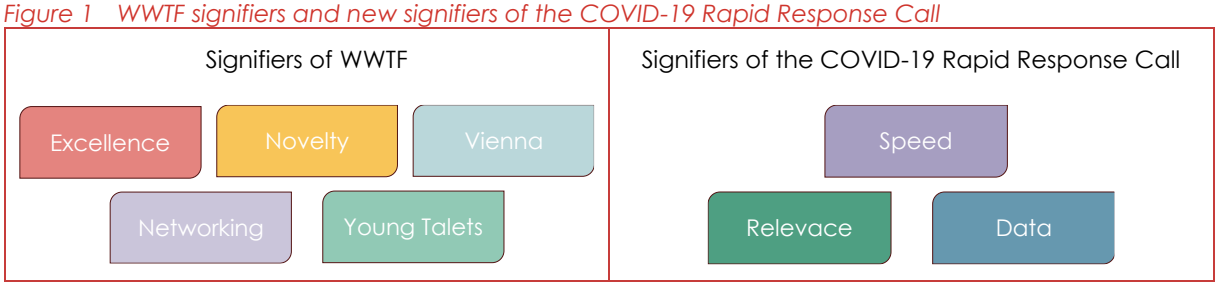
WWTF is a bridge builder for the Vienna research area. It connects universities, research institutions and other actors, brings together young research talents with outstanding research institutions and creates connections between different scientific disciplines to enable new approaches.

Source: WWTF funding guidelines, valid from August 11, 2021

A core competency of WWTF is the strict project selection based on an international peer review, which can draw on a large network of experts and the reputation of WWTF. The evaluation processes take time – this is precisely where things were done deliberately in a different way, in view of the urgency of the COVID-19 Rapid Response Call (CRRC). Based on WWTF´s mission (Box 1), Figure 1 summarizes key aspects of WWTF funding as "signifiers", i.e. as terms that convey a meaning that has yet to be determined in more detail. We compare these with three additional signifiers specific to the CRRC, which are taken from the invitation to submit a proposal.

[1] See project database, https://www.wwtf.at/funding/project-database/#P1

Figure 1 WWTF signifiers and new signifiers of the COVID-19 Rapid Response Call



Source: Technopolis

How were these specifics actually implemented? In total, the selection process only lasted 10 days. The projects were selected for funding recommendations by a jury; the applications were very short and were submitted by the rectors or heads of the research institutions, after an internal pre-selection.

This evaluation is intended to assess the process and implementation, results and effects and to formulate conclusions and recommendations in a formative part. This also applies to the transferability of the experiences from this very specific call and from comparable international experiences to the standard procedures of WWTF and possibly beyond.

The evaluation is based on a mix of methods that includes the following parts:

- Kick-off meeting with representatives of WWTF, in which information about the call and experiences were shared and, on this basis, the approach was sharpened
- Document analysis, in particular the analysis of call documents and project data (applications and approvals), WWTF self-evaluation report
- Coding and evaluation of the final reports according to impact dimensions
- A network analysis of the cooperation relationships among funding recipients as part of this call
- Interviews with representatives of submitting institutions about the submission and selection process and the relevance of the projects
- Interviews with other stakeholders
- Interviews with managers of funded and rejected projects and a focus group with project managers and project staff
- An insight into international experiences based on other studies by the Technopolis Group

During the evaluation, it quickly became clear that the COVID-19 Rapid Response Call was a coup from which we could learn a lot, but which cannot be replicated 1:1. This is due to the exceptional situation. Thanks to WWTF's good reputation, this deviation from the standard system was not a problem: we received no negative feedback throughout the entire process, not even from representatives of rejected projects,[2] but there was a lot of praise. Given the number of projects, the budget and the time frame, the scientific and societal impact is extraordinarily high. Due to the particularly short submission phase, some projects were submitted that were already prepared or that were based on many years of expertise: This enabled the management – even without a clear assignment of competence with regard to

[2] Due to the multi-stage process, we contacted a selection of the rejected projects as part of the evaluation. We focused on those projects that were dealt with in the jury process.

internal project selection – to propose these projects, which strengthened the potential for impacts. The dynamics of the first year of the pandemic partly worked like an echo chamber: Due to the lockdown, there were suddenly exempt research staff who engaged in these projects. Conversely, some data collection methods were not possible while online contacts spread rapidly and became more professional. Public attention to research and the urgency of evidence-based thinking were high, and the Futures Operation Board provided a structured, but not formally institutionalised, anchoring of policy advice by scientists that had not previously existed in this form in Austria.

The report is structured as follows: in the following chapter we provide an overview of the COVID-19 Rapid Response Call regarding the goals and processes pursued, the key aspects of the call and the content and orientation of the funded projects and their outputs. In Chapter 3 we describe the outcomes and impacts of the funding, especially at societal level, for the researchers involved, with regard to follow-up research, the Vienna research landscape and describe the challenges of empirical research work during the COVID-19 pandemic. In the fourth chapter we cover the key signifiers of the call, insights for the governance of research and impacts and learning for future WWTF calls. Chapter 5 describes international examples of comparable programmes. The report concludes with Chapter 6 and conclusions and recommendations that address the evaluation questions.

2 Overview of WWTF's COVID-19 Rapid Response Call

The following chapter describes the goals and processes associated with the programme, provides an overview of the key aspects of the call and the content and orientation of the funded projects.

2.1 Goals and processes

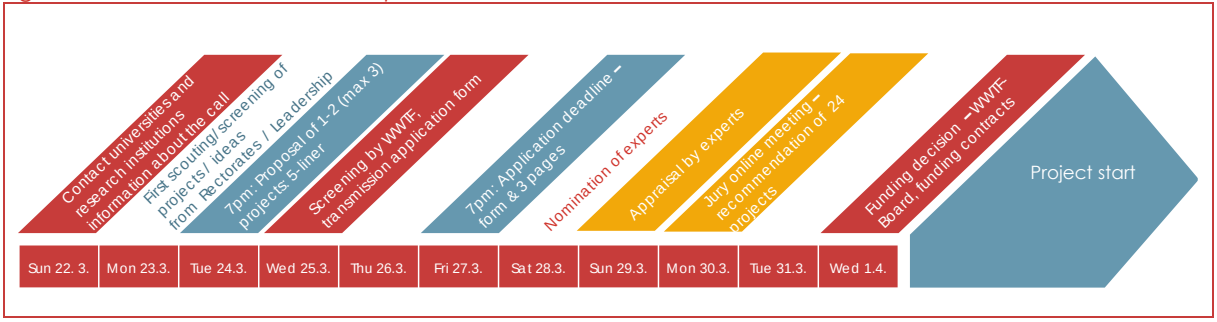
In March 2020, immediately after the Austrian federal government imposed traffic and contact restrictions ("lockdown") for the first time due to the COVID-19 pandemic, WWTF decided to provide funding for research projects by the shortest route and in a flexible manner, that meet the urgency of the situation. The aim of this call [2] was to support data collection for research purposes and related further measures during the unexpected COVID crisis in spring 2020. At this early stage of the COVID-19 pandemic, most countries were caught unprepared by the immediate and drastic impact of the pandemic on health, economy and social life. Suitable data to capture the situation was often not available. Since crises often develop very quickly, relevant findings are often fleeting and cannot be reproduced at a later date. Therefore, rapid action was key to this call, and that in the areas of health, society and economy.

The Call was carried out as a "Additional Funding Measure" in accordance with WWTF guidelines, following the subsequent specifications: "*Such requests are subjected to a formal review by the WWTF office and then, after consultation with the chairman of the Board of Trustees, sent to suitable third parties and / or members of the Board of Trustees for a short, written review. On this basis, WWTF office submits corresponding recommendations to the Board of Directors.*"

An important element in the design of this call was the limited invitation to submit: The call was not advertised publicly, but the management of universities and research institutions were invited to submit a limited number of projects (between one and three, depending on the size of the organisation). This required a pre-selection and enabled the jury to select the projects quickly.

Figure 2 shows the rapid sequence of the individual steps in the selection process: On March 11, 2020, the World Health organisation declared the epidemic a pandemic. Major events were cancelled in Austria, and the first nationwide lockdown began on March 16, 2020. Just six days later, the rectorates and the management of the research institutions were informed in writing about the call. In advance, the managing director of WWTF had already made telephone calls to these same people to check the feasibility of the call and to pass on the information as early as possible. Project ideas had to be submitted on March 24th, the deadline for submitting the funding applications (a form and a three-page project description) was March 27th. The reviews were prepared by the following Monday and compared over the course of the week so that a proposal for the funding decision could be presented to the Board of Directors in a circular resolution.

Figure 2 Tender and submission process



Source: Data: Call Information from March 20, 2020. Illustration: Technopolis

A total of 41 applications from Viennese research institutions and universities were submitted, 38 of which were sent for evaluation after a formal check. For this purpose, six experts were appointed for the jury,[3] with expertise in public health, business start-ups, genetics, Vienna innovation policy, expertise in promoting excellence at the European level, general RTI policy, economics, and different roles in the innovation system, as well as representation of the Board of Trustees. The evaluation was carried out according to four categories (see Box 2) in a scoring system, supplemented by a comment and the recommendation eligible or not for funding. The focus was on data collection, but a broader approach was taken in the selection round to achieve the greatest impact. Therefore, eligibility also included ideas about infrastructures for data collection and other forms of evidence collection [3]. Each project was assessed individually by two reviewers. On April 1, 2020, the Board of Directors decided on funding based on this funding recommendation in a circular resolution; on the same day, the funding contracts became effective, and the projects could begin. This way, 24 projects, primarily focused on data collection on COVID-19 issues, were funded by WWTF.

[3] Thomas Dorner (Medical University of Vienna), Irene Fialka (iNiTS), Klemens Himpele (WWTF Board of Trustees & CIO Stadt Wien), Helga Nowotny (RFTE), Fritz Ohler (former Technopolis), Rudolf Winter-Ebmer (JKU Linz).

Box 2 Criteria for funding under the COVID-19 Rapid Response Call

- Data collection on highly relevant questions about COVID-19, which have the potential to also lead to longer-term research questions and lines. Possible fields include economics, epidemiology, public health, virology, molecular biology, organisational issues such as operations research, logistics, psychology and much more; i.e. social sciences / etc. data collection as well as natural science / etc.: 30%
- The data must be of such nature that it can only be collected at this point in time – i.e. during the COVID-19 crisis: i.e. that the research can no longer be carried out at a later point because the data can no longer be collected, or the subject is no longer relevant. The focus is on the following methods: data collection via telephone interviews, surveys or comparable social science instruments and the collection of relevant test material and other data collection methods in the natural sciences. The forms of data collection should be necessary, ethically justifiable and, if applicable, officially approved or coordinated: 30%
- The research project must be able to start immediately, and it must be stated why WWTF funds are necessary for implementation: 30%
- Vienna connection of the project in the broader sense: 10%

Source: Jury briefing

The specific and exceptional features in that call were the procedure, both in terms of the roles of the actors involved and the duration, and the funding amount.

The increased **speed** was characterized by a very fast design process and a very fast project selection. This meant that the first wave of infections could be taken into account in the surveys. At the project level it will be seen that, depending on the content and methodological orientation, the projects started and progressed at different speeds (see also chapter 3.5). In some projects, the quick start was undoubtedly crucial for the high visibility of the results and numerous citations, some from young researchers. The urgency to collect **data** "immediately" was at the very core of this initiative. **Relevance** is part of WWTF´s mission, but only in combination with timely urgency can the relevance of the research both be directly assessed and communicated to other target groups such as politicians or the general public. Moreover, relevance was an important selection criterion and also led to high media attention and inclusion in the Future Operations Clearing Board (FOB).

Since peer review was omitted, the question arises as to how or whether it was possible not to neglect the standard of **"excellence"**, which is a central mission of WWTF. Each institution was only allowed to propose a very small number of projects (1-2 or a maximum of 3, depending on size). Universities and research institutions dealt with the task of identifying projects differently: in some organisations, emails were sent to all departments. In others, rectors contacted project managers of whom they knew were working on projects suitable for this tender. The leaders of the submitted projects were mostly very successful and experienced scientists; their publication list and track record stood as a guarantee for the expected scientific quality. What should not be left unmentioned is the fact that precisely because of the lockdown, time resources were freed up for a short period of time among top-class scientific staff at some institutions, because, for example, laboratory working time was not required. Conversely, some researchers were very burdened by new tasks such as distance teaching.

Globally[4] and locally in Vienna, there was a high level of commitment and willingness to cooperate among many researchers in the face of the major health crisis.

The fact that the pre-selection was placed in the hands of the management relieved WWTF of some of the responsibility for the usual transparency and enabled rapid selection. For two reasons, this is only suitable for similar crisis situations: on the one hand, a broad and transparent advertisement is necessary to avoid relying on networks and trust relationships that are too narrow in an a priori confusing and dynamic research system and to give opportunities to lesser-known candidates. On the other hand, the rectors and institute heads do not have the task of selecting projects; they do not have any methods or resources available to them other than consultation with colleagues. However, the core task of every management is to be able to make strategic decisions under uncertainty or in the event of crises, even with incomplete information - this was the case here.

2.2 Key coordinates of the Call

In this section we briefly describe the main features of the funding programme and provide an overview of applications and funding from WWTF by applicant organisation and discipline. We also present differences in the approaches of the funded projects in relation to the data collected and the project goals.

Applications and funding

On March 26th and 27th, 2020, WWTF received a total of 41 applications for the COVID-19 Rapid Response Call, requesting a total of around €1.6 million in funding. The maximum funding amount was €50,000 per project. Applicants had to make a personal contribution of 35% (also possible as in-kind).

Of these applications, WWTF selected 24 for its own funding.[5] 16 projects received the maximum funding amount[6], the average funding per project was around €43,000, although four projects, particularly in the social sciences, were also significantly smaller with funding volumes of less than €25,000. The following table provides an overview.

4 See various information about the mobilization of research and development in the wake of the COVID-19 pandemic, as part of the OECD Technology and Innovation Outlook 2021: https://www.oecd.org/sti/science-technology-innovation-outlook/crisis-and-opportunity/

5 One of the projects discussed in the selection process was funded by the University of Vienna from its own resources.

6 Or were very close to the upper limit at more than € 48,000.

Table 1 Overview of funding data for the COVID-19 Rapid Response Call

Total application volume	€ 1.628.883
Total funding volume	€ 1.025.538
Average funding per project	€ 42.731
Span	€ 10.800 to € 50.000
Number of funded projects	24
Number of projects submitted	41

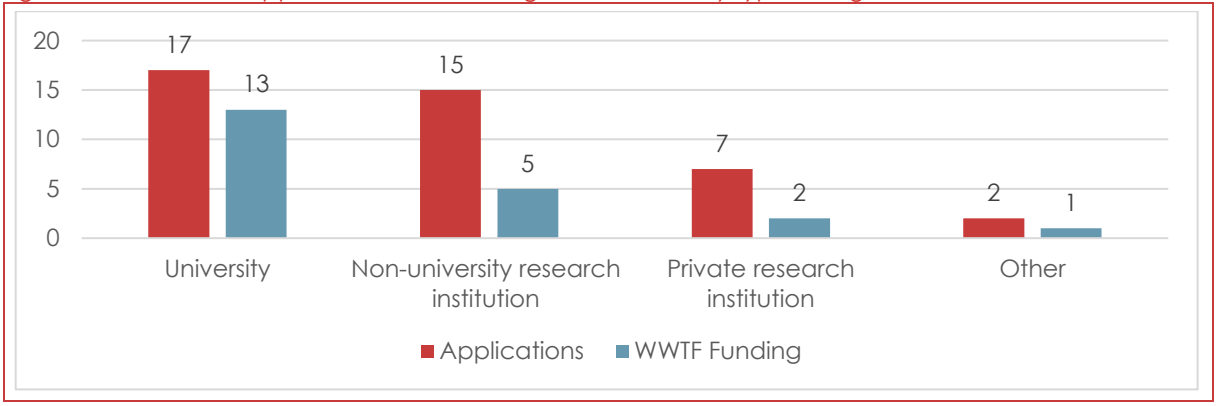
Source: WWTF, calculation and display and calculation: Technopolis

Most of the applications were submitted by Viennese universities (17), followed by non-university research institutions (15), such as the ÖAW, its institutes, or the LBG (see the following Figure 3). Private research institutes, such as the ZSI or private opinion and market research institutes, have submitted seven applications; other organisations (such as the St. Anna Children's Cancer Research Institute CCRI) have submitted two applications.

The Viennese universities also carried out most of the funded projects, followed by non-university institutions. Two projects were carried out by private research institutes and one by the St. Anna Children's Cancer Research Institute CCRI.

When interpreting the high selection rate of approx. 60% resulting from these figures, it must be noted that the tendering process differed from classic research funding calls (see chapter 0), in particular the Viennese universities carried out an internal pre-selection, several project ideas (for individual universities up to about 50) internally condensed into a few projects, or only addressed a few, highly successful research groups. The success rate therefore does not refer to the basis of all project ideas, but to the (limited total) number of proposals submitted by the managers coordinating the submissions.

Figure 3 Number of applications and funding from WWTF[7], by type of organisation



Source: Data by WWTF, calculation and display: Technopolis

[7] A project that was funded by the University of Vienna using its own funds is not included.

If we roughly differentiate between the project applications[8] according to whether they use social science (e.g. subjective experiences in the pandemic or its economic effects) or natural science research approaches (e.g. research on COVID-19, mutation dynamics or the immune system), then there is a certain dominance of social science research projects: 28 projects can be assigned to this area, the remaining 13 pursue (more) natural scientific approaches. Social science approaches also predominated among the funded projects, but to a lesser extent (14 to 10 projects).

Another characteristic of the programme is that the funded projects were often embedded in longer research trajectories and larger project portfolios for which established scientists are responsible. For example, this can be seen in the fact that the projects were able to demonstrate, on average, 68% of their own contributions (twice as much as the required 35%). However, it can also be seen in view of the unbalanced gender distribution – be it in the different representation in management functions or caused by unequally distributed care tasks during the lockdown – as of the 41 submitted project proposals, 30 were male project managers and only ten female.[9] Among the projects funded, the ratio was 19 men to five women.

2.3 Content and orientation of the funded projects

The following presentations are based on the evaluation of the project reports, which allows the projects to be characterized according to different dimensions:

Differences in handling data, project goals and practice

As can be seen from the project reports, the funded projects have different approaches to dealing with data and different objectives, which in some cases go as far as product development (an overview is provided in the following Table 2). Based on the final reports, three different types of data can be identified, which were collected using both qualitative and mostly quantitative methods. Four projects collected subjective experience using qualitative methods; 11 projects collected quantitative, standardized, subjective experiences and further 14 projects focused on observing objects (that is, some projects also combined quantitative and qualitative surveys).

- For **subjective experiences,** people were asked about their personal experiences with and during the pandemic, which were then interpreted in the course of the respective project along the lines of the research questions formulated. The projects dealt with people in the health or education sectors, for example. In part, the aim was to obtain a snapshot of the attitudes and experiences of people in Austria through qualitative research. These four research projects included an additional qualitative part, which generated data with the characteristics described here.
- Many projects have recorded **standardized, subjective empirical data**, for example through surveys, the results of which were then processed into sometimes very large data sets. To this end, various project teams have entered collaborations with other institutions or organisations to carry out large-scale surveys. Five of the data sets created by these projects are publicly accessible to other researchers in accordance with the principle of

[8] To follow up on this, we made a manual assessment based on the submitted short project applications, if necessary, taking into account the applicant scientists and the institutions.

[9] Evaluation based on the first name of the email addresses; no assignment was possible for a person.

open science.[10] 11 of the research projects generated such large data sets. Most of these projects can be classified in a psychological and/or social science field with a particular focus on public health, two or three in the broadest sense in the field of economics.

- **Objective observations** or the observation of objects took place primarily in natural scientific projects. This type of data includes areas such as research into certain aspects of the SARS-CoV-2 virus or the infection situation in Austria. Working in the laboratory was usually an important step in generating this type of data. In two to three projects, this data was used to subsequently address questions of logistical or organisational nature that should be then applied to public health matters. Two further projects were able to create computer simulations and/or models based on the data.

Five projects not only aimed to collect data, but also to **develop a product** based on this, for example, the further development of anti-gene or PCR tests or laboratory structures. According to project reports, this product development was also successful. Two of the project teams also collaborated with private companies to market the products.

The project teams **pursued different, often multiple goals**: Nine project reports show that decision-makers should be supported by the project results, for example by laying a scientific basis for decisions. These target groups were politicians, companies or public institutions such as hospitals. Furthermore, three of the projects also aimed to inform the public in general about aspects of the pandemic. The media response to the results was particularly important for this.

Six projects **were stimulated by the impression** that in certain areas there were **significant, including structural deficiencies**, which should be validated in the project and then made better disseminated.[11] Accordingly, these projects also formulate political calls for action that are based on their research. Individual reports show that the scientists involved saw considerable pressure to act.[12] This created an area of tension between projects that wanted to provide information for informed decisions, and those that directly formulated recommendations for action.

Aspects of the Sars-COV-2 virus were explicitly researched in seven projects. A priority was to gain a better understanding of the effects of infection with the virus in the human body. On the other hand, these projects wanted to contribute to the scientific research discourse around Corona through the research results. Both should specifically contribute to the development of a vaccine or improved medical treatment for infected people, for example by developing drugs to treat an infection. Six other projects had very similar research goals, but with a stronger focus on the spread and, above all, the containment of the virus in (Austrian) society.

WWTF's monitoring of the call, which was updated again with the start of this evaluation in April 2023, shows the following **project outputs**:

- **83 publications** directly related to the funding, 53 of which in scientific journals, seven as conference papers, seven book chapters and one contribution in a conference

[10] However, three projects were faced with data protection regulations, which prevented them from publishing the data at the time of writing the final report. This affected projects that are located in the area of economics and logistics.

[11] An educational psychology project hoped to use the research results to prevent school closures by pointing out the associated discrimination that affected school children.

[12] "We hope our results can put pressure on politicians to actually continue to collect theses kind of data" (EI-COV20-040-Ex-post_Eval_Report: p.4)

proceeding, plus 15 further publications. 53 publications were peer-reviewed and 54 were open access. In addition, 19 indirect publications were recorded, 15 of which were peer-reviewed

- 40 **new academic collaborations,** of which eleven international and three national
- 23 projects report at least one **successful follow-up application**
- three **scientific career steps** were recorded
- at least ten **outreach activities with companies** and 136 with the **general public** were mentioned

Table 2 Overview of funded projects – evaluation of the final reports

Institution	Funding in T€	Field	Data			Product develop-ment	Project goal and target groups					Outcome**				
			Qual. empirical data	Stand. empirical data	Quant. object observations		Support to decision makers	Research on virus	Virus society	Infor-mation	Research on societal aspects	Media response	Publi-cations*	Industry collaboration	Follow-up funding (examples)	Public event
CSH	50	SS		X	X		X					X	X	X	BML	X
IMBA	50	NS			X			X					X	X	EU IMI	X
CEMM	50	NS			X			X				X	X		FWF	
UW	49,6	NS			X	X			X							
UW	50	SS		X			X			X		X	X		FWF	
CCRI	50	NS			X			X					X		FFG	
IHS	50	SS		X							X		X		BMBWF	X
LBG	50	NS			X				X			X	X			
BOKU	24,4	NS			X			X				X	X	X	2x FWF	X
VetM.	48	NS			X	X			X				X	X		X
CSH***	50	SS			X	X	X			X		X	X		BümF	
ÖAW	40,4	SS	X	X							X		X			
ZSI	49,9	SS	X	X							X	X	X			
UW	48,4	SS	X	X			X					X	X			
MUW	30,5	SS	X	X			X	X	X		X	X	X		FFG&HE	
MUW	46,8	SS		X (MM)		X	X			X		X	X			
MUW	49,3	NS			X			X					X			X
IMP	50	NS			X	X		X				X	X	X		X
IMEHPS	24,9	SS		X							X					
TUW	50	NS			X		X		X			X	X	X	WWTF& FWF	X
TUW	37, 9	SS			X		X									
WU	10,8	SS		X					X				X	X		X
WU	15,4	SS		X							X	X	X			
WU	49,3	SS			X		X					X	X	X		X
SUM.			4	11	14	5	9	7	6	3	6	14	21	8	10	10

Source: Evaluation of final reports. *scientific and other ** according to project reports *** Project was later administered by the MUW; SS: Social sciences, NS: natural science; MM=mixed methods; BümF= Medizinisch-Wissenschaftlicher Fonds des Bürgermeisters der Bundeshauptstadt Wien, Medical-Scientific Fund of the Mayor of the Federal Capital Vienna; HE = HORIZON-INFRA-2021-EMERGENCY-02

3 Outcomes und Impacts

In the following section we describe the central funding results and impacts in the dimensions of societal impact, impact on researchers, follow-up research enabled, and impact on institutions and the research landscape. We also describe challenges for empirical research in times of crisis. The following statements refer to WWTF monitoring data [2] and an evaluation of the final reports of the projects. The latter were carried out in different detail, so that the information from them is of an exemplary nature, while the monitoring data provides an overview of quantitative indicators.

It should be noted that the qualitative research on funded and non-funded projects indicates that the **greatest added value of the COVID-19 Rapid Response Call** was that the funded researchers were able to **quickly** carry out institutionalised research on relevant topics via a project. The two unfunded applicants interviewed were also able to carry out successful research projects, but with a delay. However, the early start increased the impact both on a scientific level (publication success) and on a political and societal level (visibility and early provision of action-guiding data).

3.1 Societal impact

The funding supported a number of projects that have made key contributions to pandemic management and combating the pandemic in Austria and have therefore achieved a high level of recognition. These include the development and upscaling of the "Alles-Gurgelt" tests, which were a central part of the Vienna test strategy, or the start-up funding of the Austrian Corona Panel Project ACPP, which provided information about the atmosphere within, attitudes, or behaviour of the population during the COVID-19 pandemic. According to both the funded PIs and the jury, the high societal impact of some of the projects let to an exceptionally high level of media attention for many of the projects.

Contributions to pandemic management and combating pandemics

The evaluation of the project reports and interviews show that many funded projects were able to make unusually high and rapid contributions to impact, especially in the area of pandemic management and combating. This applies to at least nine of the projects, i.e. a share of 37%. In the following we list some examples:

As early as September 2020, one of the projects was able to develop and then commercially distribute **SARS-COV-2 antibody tests** in two different formats in collaboration with a Viennese company and two other universities. These tests have an accuracy and sensitivity of 99.9% and 90.4%, meaning they were able to keep up with the international competition at that time and even surpass them in detecting antibodies. These SARS-COV-2 antibody tests were the first of their kind to be developed and manufactured in Austria. Another project played a key role in the **development of the Viennese initiative "Alles Gurgelt"**. For this purpose, as part of a larger initiative by the Vienna BioCenter, both cost-effective PCR gargle tests and protocols for optimized sample processing and evaluation were developed. As a result, over 200,000 people in schools and retirement homes were tested free of charge in collaboration with three WWTF funded projects. The evaluation of the project reports showed that the development of PCR gargling tests made a major contribution to containing the infection in Vienna and discovered many asymptomatically infected people. Austria, and especially Vienna, took on an

international pioneering role: "*Austria, and in particular Vienna, have taken a global lead role in demonstrating the feasibility and effectiveness of PCR-based monitoring strategies*"[13].

In the area of data collection and processing, various projects contributed **to the development and implementation of the "Corona-Ampel"** (Covid "traffic light"). The Corona-Ampel was officially adapted by the Austrian government in September 2020, and its display was subsequently expanded to include a global map. According to information from the project report, people's interest in regional Corona case numbers in Austria was very high. The data was made available on the official federal government website until December 31, 2023[14] and was previously also available on the Complexity Science Hub website.[15]

Other projects supported political decision-making processes, for example through a "*weekly summary offered to the Clearing Board Future Operations*"[16]. The informal committee, abbreviated "FOB", was set up in response to the COVID-19 crisis by people in government advisory functions (Presidential Chancellery, Federal Chancellery) and was intended to make better use of the scientific capacities in Austria so that politicians could pursue an informed crisis policy [4]. In total, at least a dozen projects (including at least five permanently) were able to contribute to the FOB, which was able to "mobilize a not insignificant number of representatives from sovereign, outsourced, scientific and even private sector institutions (…)" [5].

Similar types of **information for decision-makers** were provided by the ACPP project. There, ten waves of a representative panel survey were carried out at high speed from March to May 2020 (followed by further waves), with the aim of covering as many societal aspects as possible. The main goal was to better understand the pandemic in Austria. According to information from the project report, the results of the research had a lasting impact on political decision-making processes during the pandemic, for example through weekly summaries of survey results for the Future Operations Clearing Board.

The **desire for high effectiveness** was also evident, for example, in the fact that some projects at research institutions such as the Austrian Academy of Sciences, which are usually strongly oriented towards basic research, used the funding for strengthening application- and implementation-oriented work in the course of combating the pandemic. Scientific exploitation was not planned for these projects, but nevertheless happened opportunity-driven. In this case, the work supported by the funding differed significantly from the research topics usually pursued.

Other research projects funded in the COVID-19 Rapid Response Call used the funding for the rapid collection of empirical data as intended by WWTF, but as the project progressed, they pursued **more classic, long-term exploitation strategies**, from which no faster effects were to be expected. In individual cases, the periods of attention due to the pandemic even had contrary effects on the visibility of research topics. As one researcher reports, the research project was highly relevant in the health and care sector because there were direct effects of Corona on the care area, patients, and staff. However, the results probably have received less

[13] EI-COV20-031-Ex-post_Eval_Report, p. 5

[14] Corona Commission | Corona traffic light (corona-ampel.gv.at)

[15] https://vis.csh.ac.at/corona-traffic-light/world/

[16] EI-COV20-031-Ex-post_Eval_Report, p. 4

attention from political decision-makers because pandemic management and combating appeared more important in other areas. But even here, the person receiving funding was involved in various advisory committees with political decision-makers.

Media attention for the projects

A key difference to other research projects repeatedly highlighted in the qualitative surveys of the evaluation and in the project reports - 14 projects reported this explicitly - was the high level of media interest in the research projects and the programme. From WWTF's perspective, this was also thanks to a particularly interested journalist from a news agency who attended various events, reported on them, and thus laid a good basis for further dissemination.

This high level of attention had positive effects for many projects, but also mixed effects for some. Some projects report that they have reflected on the use of media from the start of the project as part of a transfer strategy or have provided regular information from current project work aimed at the general public, for example via blogs. As part of the explicit strategies, for example, communication outputs were defined, which were then specifically distributed via a person in the organisation with good media contacts. The content was also designed according to target groups, depending on whether it was aimed at the general public or, for example, political decision-makers. In contrast to other project experiences, journalists showed an authentic interest in the content.

The project reports make it clear that the high level of societal interest in the research projects was also reflected in the fact that the projects received a high level of media response shortly after the project started (first mentions already from mid-March 2020). Projects report on media articles in various formats on ORF, in derStandard or on Vienna.at. In these reports, the media response is sometimes even described as "overwhelming" or "most obvious impact". The overall media attention was probably even higher than the individual project reports outline. Some projects did not provide any information about this in their reports, but online research or information from cooperating projects does reveal relevant media articles.

3.2 Experience and qualification of researchers

For many of the researchers involved, the funding experience was characterized by the **impression that they were making an unusually high contribution to solving concrete, acute problems**. Researchers reported that it was *"refreshing" to be able to "research in tune with the times and be in close contact with politics and the media"* (qualitative surveys, translation by the authors). The high speed required for submitting the applications, and the occasional intensive contact with the media and criticism from society, also led to an unusually high level of stress for many of the researchers involved in the projects. On the other hand, an unusually positive energy and a high level of commitment are reported.

This particularly applies to the time of **submitting the application and the initial phases of the projects, which researchers** described as very intensive because an application and an underlying project concept had to be created in a very short time. In some cases, questionnaires had to be developed in a few weeks (for which on can take months in other times) so that the data could then be collected quickly: *"The rapid response speed meant that it took a few nights to reach the target groups, in this time compression, this questioning role, that was very intensive(…)"* (qualitative surveys).

The projects started during the first lockdown, i.e. **under difficult conditions both at work** (some researchers no longer had access to work materials such as books or to their offices) **and at home** (e.g. kindergartens and schools were closed). *"The project and its insane speed was a crazy attention magnet and took up a lot of resources: University resources, private resources,*

nights, weekends..." (qualitative surveys). Individual researchers reported that they were able to counter this burden through good informal exchange within the team. The appreciation shown by WWTF for the research work, which was also expressed, for example, through an invitation to the town hall, was also supportive for the researchers.

With regard to the **impact of the funded projects on research careers,** there were positive assessments, but varying assessments regarding visibility and publication strategies, for which high speed was again an important determinant. Through **rapid publishing,** some projects succeeded in converting the high level of attention in science and society into an increased number of publications, more visibility and more citations, which the researchers believe has had a positive impact on their own careers. For example, different questions could be included in a large-scale panel study, which could then be used by young researchers for master's and doctoral theses. Other projects were published at a time when interest in COVID-19 topics had already waned, which had a negative impact on the visibility and citations of the publications (we describe some of the reasons for this in more detail in Section 3.5). And yet other projects pursued a long-term exploitation and publication strategy in which the funding only served to collect data quickly, but the resulting data sets were exploited several years later.

Because there was high scientific and societal interest in the topic, the projects also described high competitive pressure. For example, one of the funded projects quickly discovered that it was competing with large laboratories in the USA and China, which were able to bring in more resources and focus on the topic more quickly, which was also related to the appearance of the first cases in China.

Most recently, researchers reported that the fast and flexible funding also meant that some dissertations could be continued that would otherwise have had to be interrupted due to the effects of the pandemic. Other feedback suggests that the opposite was also the case, and that the high demand for attention and resources of individual projects also delayed dissertations or resulted in other projects being given lower priority.

The **intensive contact with media and the comparatively high level of communication** about the projects offered the researchers involved **an important learning field** in which exploitation strategies could be applied in practice and concrete experience was gained in dealing with media inquiries, media releases and media reception. In practice, the experience of media reception was valuable because journalists, for example, also published critical articles that would probably have turned out differently with clearer project communication.

3.3 Follow-up research

As mentioned above, COVID-19 Rapid Response Call funding was often embedded in longer research trajectories and larger project portfolios, which is why it is difficult to draw a line with respect to subsequent research projects. Some projects have described WWTF funding as start-up funding that helped to attract larger project funding. In other projects, the funding was able to build on an existing basic research strategy and deepen a new branch.

The project reports show that 10 projects were able to obtain follow-up funding, of which at least[17] five were financed by the FWF and two by the EC or the FFG. Individual RFOs were national ministries (BMBWF, BML) and sponsors of the City of Vienna (WWTF and Medical-

[17] For the evaluation by funding body, we refer to the final reports of the projects. Data is not available for all follow-up funding.

Scientific Fund of the Mayor of the Federal Capital Vienna). In addition, WWTF is aware of 13 additional follow-up fundings, so that a total of 23 of the funded projects were able to obtain other funding through the COVID-19 Rapid Response Call. The evaluation of the qualitative surveys indicates that the networks built up through the funding were used to successfully acquire follow-up projects in other partner constellations.

Particularly in the case of projects that have implemented several survey waves, the funding usually related to one or several of the survey waves, while other funding bodies then financed further survey waves. This also shows the challenge in the Austrian funding system of obtaining long-term funding for this type of research infrastructure project, because typical project funding is limited in time and a continuous survey strategy is not guaranteed.

3.4 Institutions and research landscape

The funded projects were carried out in **close collaboration** with other research partners. The project reports and the qualitative surveys showed that **cooperation experiences and resilient networks for follow-up research were a central result and,** in some cases, a basis for many funded projects. Almost all projects (23 of 24) engaged in collaborations that either expanded existing collaborations or established new ones. Managers who were involved in the pre-selection of the projects said in the interviews, that they had already agreed on possible collaborations and the avoidance of parallel submissions of similar projects before the submission. Overall, WWTF's monitoring shows that 40 new academic collaborations were started, 11 of which were international and three national (outside Vienna). However, due to the short application phase, it is reasonable to conclude that new collaborations were more likely to arise during project work, while existing networks were more likely to be activated when the application was submitted.

Cooperations with non-funded organisations

Most of the projects involved collaboration with various partner organisations - here we also refer to non-academic partners and the information from the project reports - on average there were five per project. Almost half of the research projects cooperated with a partner organisation from Vienna. In general, collaborations with other actors are cited in the reports as an important aspect of the research process.

The University of Vienna was a nodal point for collaborations in social and educational sciences, including the Austrian Academy of Sciences. The FOB and the multiplier organisation „Schulen in Wien“ (“Schools in Vienna”), were links between the more natural science-oriented and the more social science-oriented projects.

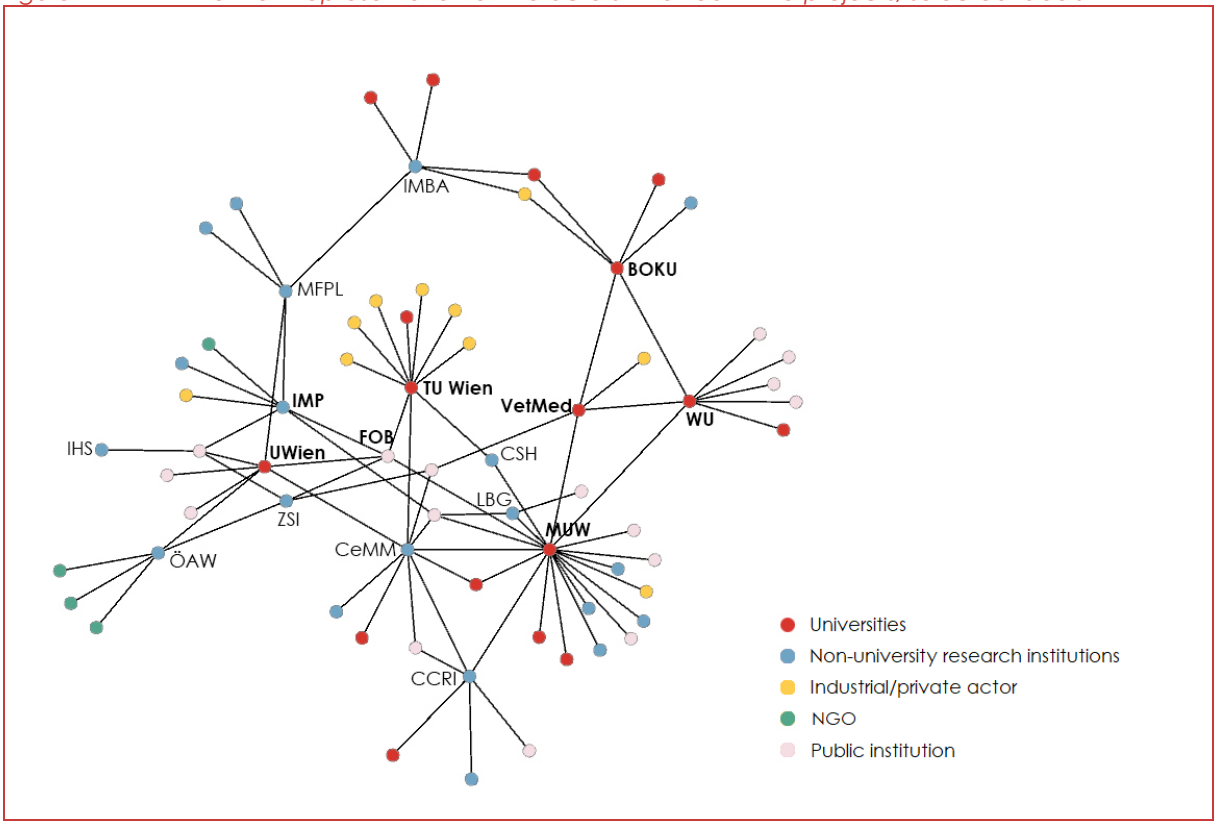
Figure 4shows the actors involved in a network representation and illustrates which institutions have taken[18] **central positions in the network;** these are also labelled. Above all, the Medical University of Vienna (MUW) was an important collaboration partner, especially for the scientific projects. In addition to four of its own projects, the MUW was directly involved in further four, more than any other research institution that took part in the WWTF call. Three of these collaborations occurred through the Department of Virology.

[18] In contrast to other calls with a limited number of submissions, the subsidiaries IMBA and CeMM (GesmbH, companies with limited liability) of the Austrian Academy of Sciences were invited to submit projects separately for thematic reasons.

The cluster of these projects also includes the University of Veterinary Medicine Vienna (VetMed), the Klinik Favoriten (hospital in the district of Favoriten in Vienna), the University of Natural Resources and Life Sciences as well as research institutions from the life sciences sector, such as IMP, IMBA and MFPL.

The University of Vienna was a nodal point for collaborations in social and educational sciences, including the Austrian Academy of Sciences. The FOB and the multiplier organisation „Schulen in Wien“ (“Schools in Vienna”), were links between the more natural science-oriented and the more social science-oriented projects.

Figure 4 Network representation of the actors involved in the projects, selected labels



Source: Technopolis, based on the evaluation of project reports

Broken down by type of actor, the evaluation of the project reports shows that a total of 26 **collaborations** on 13 projects were launched **with universities at home and abroad. Collaboration with industrial players or companies** was particularly important for scientific projects. Five projects started such collaborations. Other collaborations with the private sector included an economic project, a logistics project and a social science project. The motives for these collaborations were to finance product development (two) or to improve data collection (five), e.g. because market research companies supported data collection or companies provided company data.

The call was characterized by a high number of collaborations with public institutions. A total of 29 collaborations of this type can be found in the project reports, seven of which are medical clinics. The Klinik Favoriten stands out as it is listed as a partner in four projects, and has hosted

the largest coronavirus treatment centre in the Vienna.[19] The St. Anna Children's Hospital is also listed twice as a collaboration partner. Hospitals were particularly important cooperation partners for natural science projects, but in one case also for a psychological-social science project. Three projects also cooperated with professional associations. Other cooperation partners were organisations such as Caritas or other NGOs, which, for example, supported the recruitment of interview partners.

Three projects involve ministries as collaboration partners. The BMBWF, BMSGPK and the BML are listed here. There were links, for example, when the Corona Ampel was introduced or because departments were able to provide effective support as multipliers in promoting surveys. As part of the call, four projects entered collaboration with schools (mostly in Vienna), which in some cases were also target groups for the research. Natural, social and educational science projects worked with schools and actively exchanged ideas with each other.

Five of the projects indicate collaboration with the FOB. Only one of these projects pursued a research interest in the natural sciences, three in the social sciences and/or (educational) psychology and one in economics. Numerous other projects presented their work at the FOB.

Collaborations between the funded projects

Qualitative evidence indicates that many of the funded projects also interacted with each other. However, we cannot make any systematic statements about collaborations between the projects based on the project reports, as this information is incomplete.

In any case, there was cooperation between the projects that dealt with educational issues. There are also two other social science projects that are supposed to have collaborated based on a report, but this is not mentioned in the report of the second project. For the development of corona tests, a collaboration between three natural scientific projects in the call can be assumed.

3.5 Challenges for empirical research in times of crisis

The project reports discuss various experiences related to data collection. Difficulties arising from the rapid start of the projects are mentioned. In addition, some projects faced challenges in reaching target groups, both for social science and natural science projects. There were many ways to deal with this hurdle and it was overcome with varying degrees of success. On the other hand, there were projects, for example in the field of educational science, which did not face these challenges, but, on the contrary, were able to reach a particularly high number of participants because there was also a high level of interest among the target groups. Still other projects did not have difficulties with data collection per se, but rather needed resources, such as infrastructure, to move the research forward. This section aims to provide an overview of these aspects of data collection.

In three social science projects, **difficulties in data collection** were discussed because the target group could not be reached well enough. To overcome these difficulties, in the cases described above, a new recruitment strategy was adapted or the target group was adjusted to availability. These changes included new collaborations. For example, one project relied heavily on the initiative of NGOs to promote participation in the study among the target group. This was an important measure for the project, as the data collection phase had to be extended due to initially low participation. In another project, the team was faced with the

[19] https://covidstudien.at/

problem that many of the planned interviewees wanted to withdraw from their previous commitment. The project team suspected that the reason for this was the fear that the target group might lose their jobs if they were honest about their working conditions. By the end of the project, this recruitment barrier had not been completely overcome, despite the adaptation of various strategies. As a result, this particular target group remained under-represented until the end of the project. The projects described worked with vulnerable and/or marginalised groups. These included, for example, children, refugees and hospital cleaners.

By comparison, the education projects had an unusually good experience of data collection. One report states that six schools had already agreed to participate before the project was approved by the WWTF. Another project built on an existing collaboration with the BMBWF, which was then able to apply for participation in the study. This resulted in a very high level of participation from the target groups. However, this project was faced with the fact that, for example, children from poorer households could not be reached, although they are a particularly vulnerable group.

One of the natural scientific projects also documents challenges in data collection. In this project, blood samples from hospitalized people suffering from Covid should have been analysed. This should have happened in the summer of 2020, a time when there were too few people with this condition for the study. The strategy also had to be adapted and other collaborations had to be launched.

One project report cited the duration of the project's ethical review as a challenge that delayed the start of the project. The duration of this process is highlighted here as the project should have started recruiting Covid-sick patients as soon as possible during the first lockdown. Thus, time was a very important factor in achieving the research goals.

Two other scientific projects were briefly confronted with the problem of needing a certain infrastructure to implement the projects. In one case, it was a high-performance server that could be accessed from home office and had sufficient computing power for sophisticated computer models. This had to be purchased separately. Another project required a high security laboratory (BSL3). For this purpose, a collaboration was entered with the Karolinska Institute in Sweden and the associated Institute for Laboratory Medicine. Two other projects also cooperated with the Karolinska Institute, although the context was not clearly explained in the report.

Sufficient time series of data - ideally from before and after a crisis – are very valuable for panel surveys. Two of the psychological-social science projects were not only able to generate data during the pandemic, but also compare them with data from before the outbreak of the pandemic, for example because they worked with social media data or by building on study results from 2019. The survey contained therein was adapted to the circumstances and repeated. This enabled a detailed comparison.

4 Findings for research governance as well as experiences with and impact of the Call within WWTF

In this section, key signifiers of the COVID-19 Rapid Response Call and their special features in the research (funding) system are presented, followed by a summary of the specific effects that this call had on further steps in WWTF.

4.1 Key Signifiers of the COVID Rapid Response Call, Insights for Funding Governance

The following explanations are based on the cross-sectional analysis of our research and, in particular, on the interviews with a number of managers from universities and research institutions, and on discussions with interviewees nominated by them. This served to discuss the pre-selection of the projects and the assessments of the call with regard to the design and its positioning in the wider research system. The starting points are the signifiers of WWTF in Figure 1(p. 5), which are taken from the mission, as well as the signifiers specific to the COVID-19 Rapid Response Call, which are taken from the invitation letter for submission.

Speed

In Chapter 0on the tender and selection process, it was already pointed out how WWTF had quickly put levers in motion due to the urgency of the COVID-19 crisis, so that only two weeks after the start of the first lockdown, the research projects funded by WWTF could start. Specifically, Managing Director Michael Stampfer made a very quick decision to take action in dialogue with stakeholders: in close consultation with the Board of Directors and the Board of Trustees, on which Viennese universities are also represented, the focus was quickly placed on COVID-19-relevant data collection and the feasibility of this was explored by WWTF and the universities. Indeed, it took both sides to get the call and selection going so quickly, and to identify good projects that could start quickly.

- In contrast to other funding institutions, WWTF was able to bring in two structural strengths that – given the lack of private foundations – no other RFO in Austria has. Firstly, the decision-making paths are short, and the fund's governance is set up in such a way that political representation is guaranteed, but formally no complex instances have to be taken into account. This means that the six-member Board of Directors, the decision-making body of the WWTF, under the leadership of Michael Häupl, can quickly make a funding decision in a circular resolution, if needed. Furthermore, WWTF has experience in specifying key topics and criteria thanks to its focus on niche funding and thematic calls. Without neglecting the quality requirement (excellence criterion), WWTF is known, tried and tested for not remaining 'hands-off' in terms of topics. Thanks to this experience, the topics for the COVID-19 Rapid Response Call were quickly defined.
- Given the speed, the challenge is not to neglect the transparency of the process. This challenge was, in a sense, shifted to the research institutions, which had addressed the problem in various ways. In summary, it can be emphasized that in this short period of time, personal exchange via the telephone is important, but inevitably exclusive to some degree. However, in this context and in view of the comparatively small amount of funding, this is not so problematic, since the primary aim was to identify "meaningful" projects. The leadership of the addressed organisations, who was in contact with Michael Stampfer in advance, was then also in contact with the researchers internally; in some cases, this funding opportunity was previously communicated broadly via email. In addition to the transparent announcement of activities, which is only possible to a limited extent in crisis mode, sufficient documentation of the decisions is important. When it comes to research funding, selection shall not be made on any political ground, but inherent to the scientific system. Of course, this does not rule out the possibility that there were also dissatisfied actors who - since they were not known at management level - had no chance to take part.
- In this context, it was reported that WWTF was the first, but by no means the only body, to award COVID-specific research funding. Funding from ministries was subsequently significantly higher, but according to several interviewees, it was allocated directly and therefore in a less transparent manner. Funding from the FWF and FFG came later.

- Specifically, for the institutions we interviewed, selecting the projects was not difficult; it quickly became clear to them which projects were good candidates, and the people involved in the selection agreed on this. For such an agile approach, the PIs' previous experience is important; something that is already half-finished in the drawer is mobilized, both in terms of content and in terms of cooperation partners. It was also mentioned that in such a context, the entrepreneurial spirit of the researchers also plays a role, as they quickly pick up the phone and get partners on board. People know each other, find interesting what others are doing, and can build on support at an institutional level.
- This has also created a dynamic on the part of the research institutions and universities that appeals to people who are happy when initiatives are taken, when something goes off the beaten track. In this sense, one PI whose project was rejected said that he had no criticism of the call, but rather found it 'refreshing'.

Relevance

With regard to relevance, it has already been pointed out in chapter 3.1 that the funded projects had achieved a particularly high level of media attention and visibility – this also applies in part to research projects in connection with the COVID pandemic that were funded with other resources. It was special for the WWTF in two respects: firstly, because WWTF hardly had to do anything to achieve this; individual journalists continuously and meticulously followed the results and translated them for the public, which then took on a momentum of its own and led to further media presence. Secondly, some projects had a special status for a certain period due to the speed with which they were launched.

In addition to awareness, implementation is also of interest: the most significant example both in terms of scope and speed is probably the development of PCR gargle tests, which shaped the way the pandemic was dealt with in Austria and especially in Vienna.

At the political level, the inclusion of experts in the Future Operations Board is considered one of the main ways to prepare political decisions with scientific knowledge. The Corona map, also developed with funds from the COVID-19 Rapid Response Call, is a well-known example.

However, some interviewees also reported that the return flows of knowledge had "failed fantastically", not because of quality or communication issues, but rather due to the situation of interests. Some of the project results could only be taken into account indirectly and late. An important example of this is the issue of school closures: although the data pointed to major risks of closing, the researchers' recommendations were initially not taken up by political decision-makers. However, the FOB has succeeded in developing a common understanding among representatives of different disciplines such as epidemiology, virology and public health. A joint effort was then made to try everything else first before closing schools again.

This interdisciplinary exchange between scientists with regard to the importance for political and societal decisions (even under uncertainty) is an important experience not only for the COVID call, but for the question of new temporalities and priorities for scientific activity itself. Science is increasingly required to make a contribution to the sustainable development of the environment and society.

Experience with the call shows that this requirement for relevance – which is often perceived as a burden and as a difficulty in the design of research programmes – can have a mobilizing effect on researchers. It was reported that projects were created because people said to themselves: someone is ready to support us, if we now join forces and put all the expertise together, then that would be a meaningful activity. As a matter of fact, interviewees

mentioned that researchers had the feeling that they were doing something meaningful in this difficult situation, which mobilised many of them.

Data

The urgency to collect data immediately was the core of the initiative. Thanks to WWTF, several panels were able to consider the extremely important phase of the first two waves of the pandemic. This has led to visibility at an international level through peer reviews for publications.

With this call, WWTF was able to build on existing initiatives, in particular an Austria-wide platform on quality criteria for empirical work, in which researchers at the University of Vienna were involved. Building on this knowledge, they were then able to start a very large panel study in a very short time with WWTF funding.

The maximum amount of €50,000 for a pure data project is a sum with which one can start well and position ones own topic. The continuity of data collection beyond the course of the project was sometimes difficult. The challenge – even after the pandemic – lies in sustainable continuation and in the coherence of different approaches running in parallel. The cooperation networks (see The University of Vienna was a nodal point for collaborations in social and educational sciences, including the Austrian Academy of Sciences. The FOB and the multiplier organisation „Schulen in Wien“ (“Schools in Vienna”), were links between the more natural science-oriented and the more social science-oriented projects.

Figure 4) highlighted the great need for professional, ethical, networked, and open handling of data. The pandemic as a whole has highlighted major deficits in data collection in Austria. The data problems have not been solved today, but we know how many gaps there are, for example regarding an overview of available intensive care beds.

Volume

While WWTF project funding in the usual thematic calls ranges between €300,000 and €1 million, here it was limited to €50,000 per project. That wasn't a problem in this specific context, not least because the personal contributions were sometimes much higher. One university reported that additional staff was available – without extra funding needed – because the research groups had postdocs who could not go to the laboratory because of the lockdown and therefore had time and were interested in working. Helping out in the crisis and contributing to something meaningful was an incentive.

As reported in Section 2.323 of the projects received additional funding, without which the results could not have been achieved.

Excellence

The publication success of the projects was also discussed in Section 2.3: The issue here is how to deal with the claim to excellence throughout the entire process. Specifically, rectorates and management proposed those persons as project leaders who had already prevailed in peer reviews. However, all interviewees agree that this should only take place in exceptional situations and in which the institutions have not established their own internal selection processes. Such institutionalised processes would only make sense for much higher amounts.

Since the science system is almost constantly exposed to evaluations in everyday life – some of which also have an undesirably disciplinary effect! –, in this situation, in which manageable resources are to be allocated in a short period of time, it is sufficiently known who will prevail in the competition: the Matthew principle applies. The speed and flexibility of the call were met with great, even emotional, reactions and gratitude. However, this experience cannot serve

as a pilot for how to overcome the weaknesses of the usual evaluation system, such as the costs coming along with rigidity and duration.

Novelty

The novelty value on a scientific level can only be assessed indirectly in the context of this evaluation. In addition, there is a specific novelty value in the mobilizing power of this early call in a radically exceptional situation. One focus group participant reported on an *"...incredible speed, huge amounts of resources were poured in, including university resources, also private resources, nights, weekends, from a wide variety of [colleagues] who worked on the project. That wiped out everything else, delayed dissertations, and put other projects on hold; because that was important at the moment!"*.

What was new for many researchers was the opportunity to carry out concrete and directly socially relevant science and to accompany the crisis. What was also new was the mobilization power among the target groups of the survey: in the panel study at the University of Vienna, 45,000 people started filling out the questionnaire, 20,000 filled it out, which allowed longitudinal analysis of different target groups.

However, these successes were only possible because they were embedded in long-term strategies and because ideas and formats that researchers already had in their drawer were implemented. Given the special situation of the lockdown, research management capacities were of great importance. People who are particularly well connected became active, which in turn led to new partnerships and new qualities of these partnerships.

Finally, it should be mentioned that the focus on data, which was taken up further by WWTF in a new call (see section 4.2), also sends a signal that appears to be here to stay.

Vienna

The reference to Vienna was important in the cooperation relationships mentioned - the vast majority of the collaborations were with Viennese stakeholders, so that existing networks were consolidated. This also happened at the impact level, e.g. in supporting the City of Vienna's pandemic management by developing the "Alles-Gurgelt" test procedures. In addition, observations were made of the impact of school closures, for example, or of mental health problems with a focus on those affected in Vienna.

4.2 Implications and lessons for future WWTF activity

In its self-evaluation report, WWTF formulates some immediate lessons learned and effects on WWTF itself. In addition to the experience with the COVID-19 Rapid Response Call, WWTF had already had experience with a "complementary instrument" in the area of transfer activities since 2017[20]. PIs of completed WWTF projects could submit applications for additional funding of up to € 50,000 in three calls to communicate their results to target groups outside the scientific community. Later, in 2022/23, an initiative was launched together with the Vienna Business Agency to support the development of strategies/roadmaps to implement the ideas of digital humanism in organisations[21]. In both cases, the project applications were evaluated by a jury and without peer review and recommended for funding.

[20] NEXT, https://wwtf.at/funding/programmemes/ei/#NXT22

[21] https://wwtf.at/funding/programmemes/ei/#RO22

- In view of the acute crisis and the associated haste, the experience with the COVID-19 Rapid Response Call was decisive for the revision of the funding guidelines in 2021: the funding amount for additional funding measures was increased from €50,000 to €100,000. In addition, more opportunities were created for flexible, smaller formats and individual evaluation processes were introduced, which were soon implemented:
  - In March 2022, the OeAW launched an emergency call for researchers from Ukraine to enable researchers who were unable to continue their work in Ukraine due to the war to work in Austria through scholarships. With the increased amount, WWTF was able to support this project with €100,000.
  - The call for "WWTF Excellence Planning Grants" started in June 2022, providing financial support of up to €30,000 for Viennese research institutions that took the lead in an application for a cluster of excellence as part of the FWF excellence=austria initiative. Here only a formal check was carried out and the funding decision was made by the Board of Directors on this basis.
- According to the WWTF, the experiences with the COVID-19 Rapid Response Call were decisive in announcing the "Public Health" project call in 2022[22].
- The problem of research with data, long-term panels and especially registry data and the development of the Austrian Micro Data Center (AMDC) has been preoccupying WWTF for some time. The experiences with the COVID-19 Rapid Response Call were also incorporated into the call for proposals for the "Empirical Social Sciences" pilot funding programme.

In addition to these effects on the own institution stated by WWTF, we see further effects resulting from shifts in the role of WWTF, which both promotes and accompanies science (i.e. institutions and people) in a new social positioning: By naming the call a "rapid response", WWTF deviates from the classic positioning of "curiosity-driven research" in that the call sees itself as a response to the crisis and promotes answers to problems arising from this crisis through scientifically sound analyses with empirical reference. In contrast to numerous contemporary programmes and initiatives that pursue very ambitious goals (particularly the sustainability goals), in the achievement of which the contribution of individual projects is difficult or impossible to prove, the COVID-19 Rapid Response Call sets a counterpoint, so to speak: it is certainly representative of "third generation research governance", which is oriented towards the impact of research on major societal challenges, but has clearly defined, concrete goals that are manifested in the selection criteria.

[22] https://wwtf.at/funding/programmemes/ls/#LS22

Box 3 Third generation research governance

Modern R&I funding and governance structures have been built over successive and increasingly comprehensive generations. If you look at developments since the Second World War, three generations can be distinguished [9]:

- Vannevar Bush's report to the US President, 'Science, the Endless Frontier' [10], shaped the first generation. He argued that the war demonstrated the destructive effects of science when directed by society. Society should therefore delegate the problem and scientific quality control to the researchers themselves. Bush invoked a "linear" or "science-push model" and claimed that "basic research" would eventually produce innovations and other benefits for society more broadly. As a consequence, the National Science Foundation was founded, the FWF was founded in Austria in 1967.
- From the early 1960s, the OECD promoted a second generation under the slogan "science policy" that sought greater societal control of science and demanded social benefits in the form of innovation and economic growth by combining scientific possibilities with a "demand pull". The innovation theory then became increasingly systemic, people thought of it in terms of "national innovation systems". In this context, various initiatives were taken in Austria to promote cooperation between science and business, especially in the 1990s.
- The third generation now aims to address societal challenges such as climate change, disease and biodiversity loss. These not only affect the R&I system, but also society in the broader sense, which helps decide which societal challenges should be addressed.

Source: Based on Arnold & Barker, What past changes in Swedish policy tell us about developing third-generation research and innovation governance, 2022

In the future, it may be important for WWTF – and it would not be the first time that it has taken on a pioneering role – to consciously and possibly explicitly address in its calls what the primary concern of the funding recipients is: the answer to an urgent problem (and thus the production of scientific findings), or the curiosity-driven further development of the knowledge base (and thus the production of answers to socially relevant questions). In the second case, a solid, independent peer review process is unquestionably indispensable both for the hygiene of the science system and for the transparent and quality-oriented concrete selection of each individual project: this discourse on projects is needed in order to fund excellent research and to make room for new developments.

In the first case, it will be important to learn from the Covid call, as the jury was not made up of peers, but rather of social stakeholders with a connection to the research and innovation system. This experience is of great importance given the shift towards *transformative governance* of research, even if it was tried out on a small scale. Research that is intended to provide an answer to a problem requires the selection of people who understand something about the social problem and about the ways in which research finds its transfer into society. WWTF managed to give these jury members clear instructions on the four selection criteria (see Box 1) in a very short time, which enabled the selection to be coordinated at short notice.

5 International experiences: Covid-19 research funding as a basis for programmes in crises and emergencies

In the wake of the coronavirus pandemic, many research funding institutions took various emergency measures to invest funding as quickly as possible in important research questions to combat the pandemic. To date, there is only limited evidence of the impact of such

measures. Some funders even explicitly decided not to carry out impact studies on their Corona programmes because it is a unique situation and there is only a limited normative basis for evaluation because there is no basis for comparison with other programmes. Other funders have nevertheless conducted or plan to conduct various evaluations, both on impacts and processes. Above all, two impact studies on UKRI's Corona programms should be mentioned [6,7]. This also includes comparative research with several other funders. We are largely referring to these studies here.

Funding organisations assess differently the question of whether the funding processes implemented in response to the pandemic should be seen as a unique historical exception, or whether emergency funding is a new (or in some cases even established) part of the task of a research funder. The different decisions mentioned above to evaluate the Corona programmes are an indication of this.

It should be mentioned at the outset that sponsors in the medical sector often have standard processes for combating pandemics of all kinds, some of which are specified by the WHO.[23] Such standard procedures were most recently used in the Ebola and Zika outbreaks. However, these processes do not necessarily involve research funding, but rather communication and targeted capacity building in specific research institutions to quickly detect diseases, understand spread patterns, and develop preventative/curative means. These standards are therefore, firstly, only of limited use as guidance in the design of research funding and, secondly, are hardly relevant for societal emergency situations other than pandemics.

5.1 Examples of existing emergency programmes in the USA and Japan

Some funding organisations already had emergency programmes in place before the pandemic, especially organisations in regions where natural disasters (hurricanes, earthquakes, etc.) often occur. Above all, the RAPID programme of the US National Science Foundation and the J-Rapid programme of the Japan Science and Technology Agency (JST) should be mentioned here. Both emergency programmes existed before the COVID-19 pandemic and were used several times before (e.g. in response to Hurricane Katrina and the Fukushima disaster). However, these two programmes differ fundamentally in their approach to assessing funding applications:

The **NSF RAPID programme** awards projects worth a maximum of $200,000 (approximately €190,000). As in the WWTF COVID-19 Rapid Response Call, applications should be short (maximum 5 pages) and must explain why the requested project needs to be carried out urgently. Applications are evaluated within the NSF by so-called "programme officers". They can also request external peer reviews for applications, but this rarely happens. The RAPID programme comes from the Small Grants for Exploratory Research (SGER) awards, which have been intended to promote particularly innovative project ideas since the 1990s [8]. Traditional peer review is therefore not used for this purpose or for the new purpose of emergency research.

Projects worth up to €500,000 were awarded in the JST's **J-Rapid programme.** Unlike the NSF RAPID programme, J-Rapid uses a traditional peer review process. However, J-Rapid reviewers must evaluate the applications immediately and provide JST with their reviews immediately. We are not aware of any definitive deadlines for this, but urgent review work is culturally

[23] See e.g. https://www.who.int/westernpacific/activities/preparing-for-pandemics

anchored.[24] This may be due to the more frequent emergencies in the region. The programme is also relatively well known among researchers, is considered prestigious, and colleagues and superiors accept it when assessment work needs to be done for J-Rapid applications in an emergency. In some cases, quite large projects are funded within just a few weeks.

5.2 Examples of instruments established in the wake of the COVID-19 pandemic in the Netherlands and Great Britain

Funding organisations that did not have an emergency instrument in place to begin with have often tried to fund relevant research on the coronavirus pandemic through their regular funding processes and instruments. They tried to speed up existing processes (e.g. through faster administrative work and reduced time windows for peer review), but in the case of **UK Research and Innovation (UKRI),** for example, this was only achieved to a very limited extent. Although UKRI responded to the Corona pandemic with significant investments (and ultimately with a significant impact), the process evaluation showed that the IT system used by UKRI did not allow a special emergency funding instrument to be created and implemented quickly enough. A lot of manual work was necessary to adapt the systems, which, due to technical limitations, ultimately only resulted in a slight acceleration of the procedures already provided for in the system.

UKRI's Corona funding is still considered a success due to its numerous far-reaching impacts. This includes funding for the development of the Oxford/AstraZeneca vaccination up to social science surveys that were able to determine the effect of the lockdowns on, for example, domestic violence, which in turn provided important insights for police work. To this end, decades of investments could be drawn on in this area (e.g. in research into vaccine development, centers, networks, etc.), and existing networks between funders and researchers were of particular importance. As an "instrument" in the true sense, the UKRI funding is not considered replicable despite its extent and impact, especially because it required a significant amount of work from UKRI employees, which was difficult to justify even in an extraordinary emergency.

Other funders have also set up special emergency tools. The **Dutch NWO Fasttrack Data Programme** is particularly similar to the WWTF's COVID-19 Rapid Response Call. The objectives of the programme were defined by members of the three Domain Boards (research councils) of the NWO and NWO employees. NWO put together a team of its own employees who could focus full-time on implementing the programme. This meant that the programme could also be set up very quickly:

The decision to set up the programme was made in March 2020. Although it was a completely new programme, it took only four days from the decision to publish the call for proposals. The call for proposals was published on Friday and by Tuesday of the following week NWO had received enough applications to allocate the €1.5 million budget. Similar to WWTF, a total of two weeks passed between the start of the programme and the first funding decisions. However, in the Netherlands the funds were allocated on a ‚First come, first served'-principle.

As with the NSF's RAPID programme, NWO relied on internal resources for project selection and bypassed peer review because it was deemed too time consuming for the grant's objectives. The maximum funding amount per project was €50,000. As with the COVID-19 Rapid Response

[24] List of cases where J-Rapid has been used: https://www.jst.go.jp/inter/english/programme_e/j-rapid_e/j-rapid.html . Similar cultural norms were found in MoST in Taiwan.

Call, they should primarily support necessary data collection at the peak of the pandemic, data collection should start immediately, and research results should be achieved within months or at the latest within a year. The first projects were completed by the end of September 2020.

5.3 Lessons Learned for selection under high time pressure

It is important to mention here that in the vast majority of cases, these speed-oriented programmes only made up part of the funder's Corona measures. In other programmes, NSF, JST and NWO also funded projects that were extremely relevant to the pandemic, but for which there was less time pressure and funding was therefore possible through regular procedures.

The UKRI impact studies concluded that research funders should generally have an emergency programme in place that can be used in societal emergency situations of all kinds (i.e. not just pandemics) to address particularly urgent research, knowledge, data and development gaps as quickly as possible to fill. In summary, the following applies to such programmes:

- Particularly quick funding is possible if external peer review is ignored and the selection process takes place completely internally, for example, by employees of the funding organisations. One variant is to bring together a special jury for the specific emergency (such as the so-called UKRI Covid Taskforce, as was done for the COVID-19 Rapid Response Call)
- Sufficient academic expertise among the funder's employees is required to completely or largely replace the suspended peer review (for example, the 'Programme Heads' at the NSF are partly highly qualified academics with research experience)
- Funding amounts per project are generally low for instruments without peer review (usually less than €200,000), as a certain "residual risk" is reasonable with such amounts
- Peer review is generally necessary for larger funding amounts, but can be difficult to speed up. The J-Rapid programme offers an approach here, but it should be culturally anchored across the entire national research landscape so that "emergency reviewing" is recognized and accepted by reviewers
- Funding applications for such programmes should be brief and, above all, demonstrate the urgency and immediate benefits of the proposed research
- Time frames for the research itself should be kept very short (maximum one year or considerably less, depending on the context)
- In any emergency, the funder should define the desired topics and research approaches as clearly as possible so that the instrument is not overwhelmed by a large number of irrelevant applications. As with the NWO, the emergency instrument can be aimed exclusively at projects for rapid data collection. Alternatively, priority topics can be defined through communication between funders and relevant government bodies, as[25] was the case with UKRI and the Scientific Advisory Group for Emergencies (SAGE), which jointly defined urgent priority topics
- NWO is currently considering maintaining the Fasttrack Data Programme for future emergencies. A programme evaluation is planned for this purpose. It is still unclear whether UKRI will follow the recommendations to set up an emergency programme. The J-Rapid

[25] https://www.gov.uk/government/organisations/scientific-advisory-group-for-emergencies

programme has been used several times since 2011 and this can be expected in future emergencies (the last call related to research on the earthquake in Kahramanmaraş, Turkey, and was carried out in March 2023). The situation is similar with the NSF RAPID programme

5.4 Outlook: Emergencies and impulses for action for funding organisations

Finally, it remains to be clarified how the use of such an emergency instrument is initiated: How is it decided whether an "emergency" has occurred? There is no general conclusion on this, as much depends on how directly a funding organisation is controlled by higher bodies and ministries. As mentioned, the decisions regarding the NWO Fasttrack Data Programme were made independently by the NWO research councils. In the UK, the Director of UKRI is represented on the SAGE committee, which communicates directly with the government. The basic principles of the emergency research deemed necessary were developed as part of this communication. While UKRI did not have an emergency programme, government-affiliated bodies of this type (sometimes known in German as the Science Council) might be well placed to declare an "emergency." For funders who report directly to a ministry and have little independent decision-making power, the ministry in question would be considered for this role. In Austria it was shown that WWTF could benefit from not being subject to such a decision-making process, since the Board of Directors is the final decision-making body, and the fund also has a flexible set of rules.

It is advantageous if funding priorities for emergency funding instruments are determined with the help of the target groups or users of the research results. These can be represented in the selection process (e.g. in panels). Otherwise, committees such as scientific councils or government bodies can forward even the most urgent research questions for emergency response to the funder. Then, these questions must be based on the possibilities of research if they are to be specifically considered in funding programmes. In any case, it is important that the funding decision also includes expertise regarding the relevance of the project goals.

However, there are also arguments that the funder himself can use the emergency instrument as independently as possible from other committees. In our impact studies for UKRI, we recommend that funders use such instruments on a small scale as often as possible so that they are functional and employees know how to use the instrument optimally in an emergency. This means that even for events that are not necessarily classified as emergencies in the media and are far from comparably to the Corona pandemic in scope, sponsors should be able to use the instrument, both to provide assistance in smaller crises and for maintenance (and, if necessary, optimization) of the instrument itself. This requires the involvement of target groups and the consideration of the needs of those affected. The funder himself should be able to use the instrument independently and without the need for an emergency declaration from elsewhere, and should be able, for example, to divert a small part of his budget into such an instrument.

6 Conclusions and Recommendations

Overall, based on the surveys, there is a very positive picture of WWTF's COVID-19 Rapid Response Call, which is underlined by the fact that we heard little to no criticism during our work. Given the number of funded projects, the comparatively low budget and the short time frame, the scientific impact and societal impact are extremely high. In addition, the call also had a mobilizing effect on the atmosphere of the Viennese researchers as WWTF suddenly opened up scope for action. The central prerequisite for this is the structure of WWTF – small, independent, a fund, trust capital accumulated over many years, good networking and strategic competence. These elements cannot be transferred 1:1 to public institutions, but it is important to recognize the advantages of such an institution and to promote them both in research funding and in other areas.

In terms of the evaluation dimensions of process and implementation, outcome and impact as well as learning effects and transfer, we arrive at the following conclusions and recommendations:

6.1 Process and implementation

The central funding criteria (Box 2above) were a **focus on data collection** on highly relevant questions about COVID-19, for which there was a **high level of urgency** because the data could no longer be collected later or the items were no longer relevant, and the opportunity for project applicants **to start immediately**. The collection of data and the creation of data sets were a central part of the funded projects. Many projects had potential for future development. 23 of the 24 projects received further funding. At a systemic level, however, there is still difficulty in ensuring the maintenance of long-term data series on project financing.

A **special feature of the call** was the speed achieved by WWTF in the design and execution of the call, which was also made possible by the involvement of organisational management such as the rectors in the pre-selection of projects. Unlike other funding organisations, WWTF was able to rely on the "Additional Funding Measure" programme, which allowed this call to be designed flexibly. At the same time, the funding of a maximum of €50,000 was lower than in usual WWTF calls and was therefore intended as start-up funding or as a piece of the puzzle in larger research projects. The autonomy of the fund, in which the Board of Directors is the final decision-making authority, also enabled rapid implementation.

The **high speed of design and selection** was a key to the success of the funded projects; the contributions to societal impact were made faster and to a greater extent. From a scientific perspective, the projects had an advantage in the scientific publication and citation competition because the results were available particularly early and the content of the first two waves of the corona pandemic had already been considered. This means that the **goal of quickly enabling data collection for research purposes and other measures was achieved.** At the same time, the COVID-19 pandemic has also posed major challenges for the collection of empirical data – especially in the social science area (lockdown, target groups that are more difficult to reach, etc.), to which the funded projects had to adapt methodologically.

In times of crisis, we have to rely on existing networks and trust institutionalized there if we want to react quickly. Therefore, WWTF tended to support **established scientists with a high reputation and existing research trajectories in the CRRC.** The projects were carried out in a highly professional manner and, as mentioned, often had a high impact. However, this was probably also a reason for the high proportion of men among project managers. The diversity of disciplines and interdisciplinary research, partly coordinated upfront by potential applicants, were instrumental in achieving the greatest possible impact. At the same time, the call brought

to the stage among these people rather those who, in addition to their scientific skills, also had a certain entrepreneurial spirit and in any case a high level of motivation to make a contribution to solving the crisis.

Recommendations

1. The selection process can be used as a model for comparable calls in an acute crisis, with similar deadlines, pre-selection by the research institutes and a jury made up of stakeholders and experts
2. Fast procedures build on existing contacts and close, short-term communication. In the interests of traceability and transparency, it is important to document decision-making – even if it is partly subjective due to the crisis. This documentation is available regarding the jury recommendation; it could also be requested from the submitting research institutions and universities in future calls of this type
3. Efforts in other programmes to diversify the field of established scientists should be continued so that the gender distribution is better balanced in the next crisis
4. Even without a specific crisis context, a flexible data collection instrument could be set up to ensure the continuity of surveys and the coherence of work in cooperative networks

6.2 Outcome und Impact

The funded projects were often able to acquire additional funding, enter new types of collaborations, including with non-scientific organisations, or were able to carry out multi-wave surveys beyond WWTF funding, albeit not always with long-term funding. The project results vary; some projects focused on making concrete and rapid contributions to pandemic management or overcoming the pandemic, while a classic, scientific evaluation may have been of secondary importance. Although the funding was able to make important contributions to the development of significant pandemic management tools, the long-term scientific usability of these projects has diminished as scientific and societal interest in the topic has waned. Where the projects are part of a long-term research trajectory, the corresponding research work will be continued.

We rate the ratio of the comparatively low, but very quickly mobilized funding on the one hand and the societal impact generated (improvement of test methods and scale-up, contributions to the Corona traffic light and information for the Future Operations Clearing Board) and media visibility on the other hand as extremely positive. The call also strengthened the links between interdisciplinary projects and interdisciplinary policy advice. With regard to research careers, it is difficult to make a clear judgement: on the one hand, training paths were stabilized by the funding during the crisis and some young researchers reported a career boost due to the rapid publications that were also made possible by the funding, which generated a high level of visibility. In other cases, the high societal relevance of the projects has led to a different prioritisation in the working groups, which has also led to the delay of qualification work. The empirical surveys also indicate that the various project collaborations resulted in medium-term follow-up collaborations. This may also be partly due to the intensive experience of cooperation during an acute time of crisis.

Within WWTF, the experiences led to several next steps: The funding guidelines were adapted in 2021 to make the format of the "Additional Funding Measure" even more flexible and to increase the maximum funding amount. This has already benefited a funding initiative for Ukrainian scientists in exile, funding for the preparation of submissions for the FWF Excellence-Cluster Call and a cooperation with the Vienna business agency in the area of Digital

Humanism. Two new project calls are based on the findings from the call (Empirical Social Sciences 2022) or were triggered by it in the first place (Public Health Call = Life Sciences 2022).

Recommendations

5. Despite its small size, the COVID-19 Rapid Response Call positions itself as an interesting example of the current development towards the third generation of research governance, in the sense of transformative concerns. In view of the interesting and diverse impact paths, we recommend ongoing monitoring of the people involved in the COVID-19 Rapid Response Call projects or the commissioning of a research project: typology of target groups, follow-up activities, response from the media and the public, gender balance, implementation paths.

6.3 Learning effects, transfer

Selection procedures are part of scientific quality assurance, but also ensure legitimacy among researchers and political decision-makers.[26] WWTF has enjoyed high recognition and trust among both groups for many years for attracting and selecting high-quality research proposals and subsequently supporting their implementation. Against this background of usually comprehensive evaluation processes, an exception can be made in the event of a crisis to select projects extremely quickly and at the same time still generate legitimacy.

At the same time, the great relief with which applicants respond to this exception and agility is an indication of the usual burden that otherwise results from more cumbersome research funding offers. Unlike other research funding organisations, WWTF can be "agile" in this sense thanks to its statutes as a fund and the governance that involves legitimate people in both politics and science, in combination with good, strategic management.

The advantages of this agility were particularly evident in international comparison, because WWTF was able to use the "Additional Funding Measure" programme in times of crisis to react quickly. Based on international studies, it is advisable to use the "Additional Funding Measure" programme not frequently, but still regularly in the event of a crisis, in order to test how to deal with them in other crisis scenarios and not to forget how to use them. The Ukraine crisis would have provided an opportunity for a similar programme, for example, with the subtopics of flight, trauma, economic effects, security and geopolitics. In this context, WWTF – in view of its mission to take the Vienna-related research into account – promoted an initiative by the ÖAW to support Ukrainian scientists in exile in Austria to continue their research activities through scholarships.

Recommendations

6. As a rule, the usual selection processes should be maintained
7. The possibilities of the "Additional Funding Measure" are well suited to reacting flexibly to specific needs. We recommend that these activities of WWTF also be proactively showcased on its own homepage, thereby supporting the discourse on the engagement of research in relation to (current or pressing) social problems

Overall, the COVID-19 Rapid Response Call has set a marker in the mobilization power of scientists for societal concerns, willingness to cooperate and interaction with a political advisory body in Austria. We recommend continuing to use this experience at least over a period of 5-

[26] See https://www.ihs.ac.at/events/event-reviews/dispersionsfragen-in-der-forschungsfoerderung/

10 years as part of an interactive research project to investigate development paths and possible shifts in the constellation of actors in the research and innovation system (cf. recommendation 5).

Appendix A List of abbreviations

ACPP	Austrian Corona Panel Project
AMDC	Austrian Micro Data Center
BMBWF	Bundesministerium für Bildung, Wissenschaft und Forschung, Federal Ministry of Education, Science and Research
BML	Bundesministerium für Land- und Forstwirtschaft, Regionen und Wasserwirtschaft, Federal Ministry of Agriculture, Forestry, Regions and Water Management
BMSGPK	Bundesministerium für Soziales, Gesundheit, Pflege und Konsumentenschutz, Federal Ministry for Social Affairs, Health, Care and Consumer Protection
BOKU	Universität für Bodenkultur Wien, University of Natural Resources and Life Sciences Vienna
BümF	Medizinisch-Wissenschaftlicher Fonds des Bürgermeisters der Bundeshauptstadt Wien, Medical-Scientific Fund of the Mayor of the Federal Capital Vienna
CCRI	Children's Cancer Research Institute
CeMM	CeMM Forschungszentrum für Molekulare Medizin GmbH, Center for Molecular Medicine
COVID-19	Coronavirus disease 2019
CRRC	COVID-19 Rapid Response Call
CSH	Complexity Science Hub Vienna
EU IMI	EU Innovative Medicines Initiative
FFG	Österreichische Forschungsförderungsgesellschaft mbH, Austrian Research Promotion Agency
FOB	Future Operations Clearing Board
FWF	Österreichischer Wissenschaftsfonds FWF, Austrian Research Promotion Agency GmbH
GWP-Richtlinien	Richtlinien zur Guten Wissenschaftlichen Praxis, Guidelines for Good Scientific Practice
HEY	HORIZON-INFRA-2021-EMERGENCY-02
IHS	Institut für Höhere Studien, Institute for Advanced Studies
IMBA	Institute of Molecular Biotechnology
IMEHPS	IMEHPS.research Forschungsinstitut für Sozialpsychiatrie GmbH, Research Institute for Social Psychiatry GmbH
IMP	Research Institute of Molecular Pathology
JST	Japan Science and Technology Agency
LBG	Ludwig Boltzmann Gesellschaft, Ludwig Boltzmann Society
MFPL	Max F. Perutz Laboratories
MUW	Medizinische Universität Wien, Medical University Vienna
NGOs	Non-governmental organisation

NSF	National Science Foundation
NWO	Dutch Research Council
ÖAW	Österreichische Akademie der Wissenschaften, Austrian Academy of Sciences
OeAWI	Österreichische Agentur für wissenschaftliche Integrität, Austrian Agency for Scientific Integrity
OECD	Organisation für wirtschaftliche Zusammenarbeit und Entwicklung, organisation for Economic Cooperation and Development
PCR-Tests	Polymerase-Ketten-Reaktion, Polymerase chain reaction
PIs	Principal Investigators
SAGE	Scientific Advisory Group for Emergencies
SARS-COV-2	severe acute respiratory syndrome coronavirus type 2
SGER	Small Grants for Exploratory Research
TUW	Technische Universität Wien, Technical University of Vienna
UKRI	UK Research and Innovation
UW	Universität Wien, University of Vienna
VetMed	Veterinärmedizinische Universität Wien, University of Veterinary Medicine Vienna
WHO	World Health organisation
WU	Wirtschaftsuniversität Wien, University of Economy Vienna
WWTF	Wiener Wissenschafts-, Forschungs- und Technologiefonds, Vienna Science, Research and Technology Fund
ZSI	Zentrum für Soziale Innovation, Center for Social Innovation

Appendix B Sources

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Appendix C Interviews und focus group participants

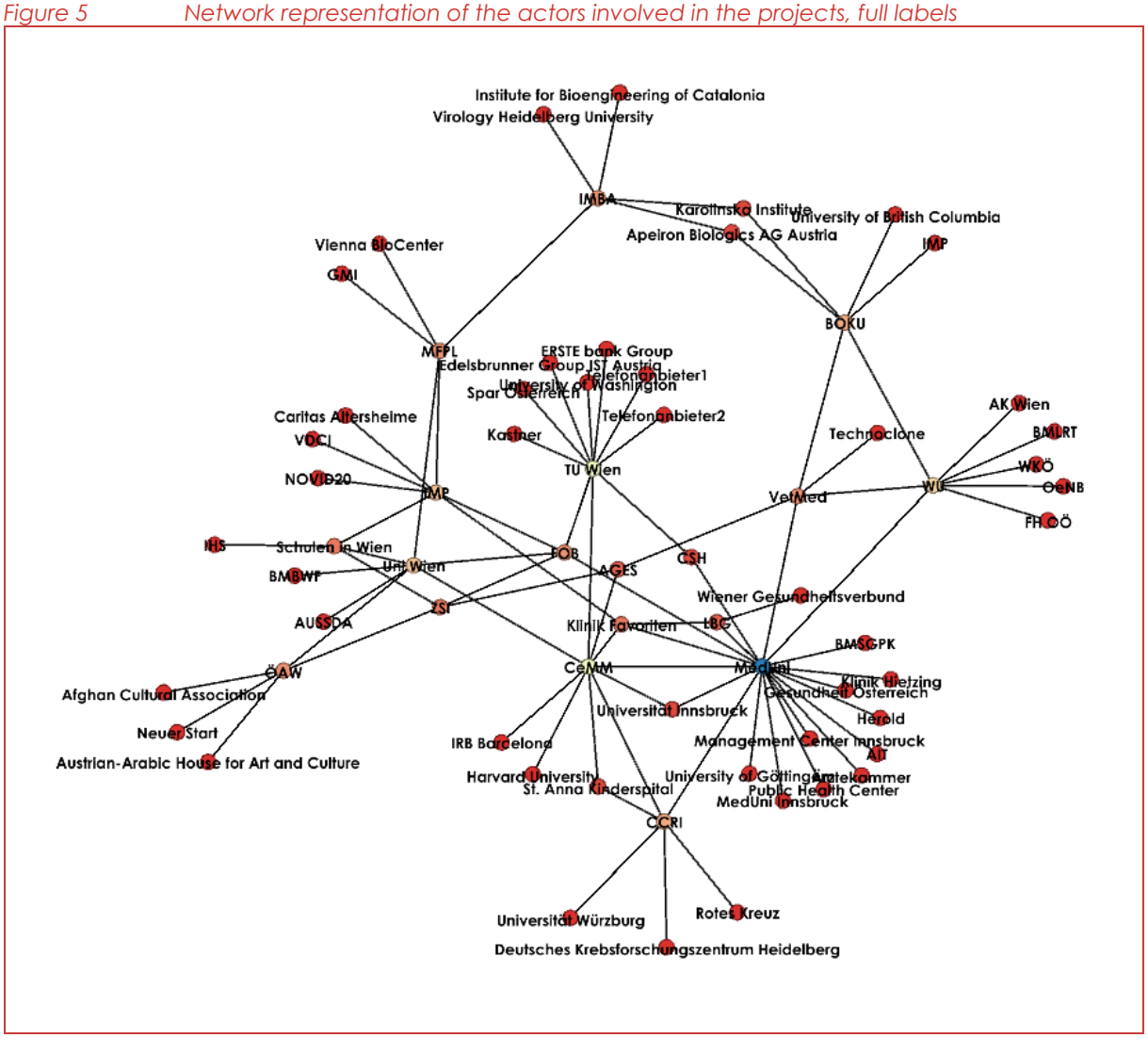
- Univ. Prof. Otto Doblhoff-Dier, Vice Rector for Research, University of Veterinary Medicine Vienna
- Dipl.-Ing.in Dr.in Michaela Fritz, Vice Rector Research, Medical University of Vienna
- Dr. Werner Hölzl, WIFO
- Dr. Thomas König, Institute for Advanced Studies (IHS)
- Univ.Prof. Claus Lamm, University of Vienna
- Univ.Prof. Christiane Spiel, University of Vienna
- Assoc. Prof. Amelie Desvars, PhD
- Univ.-Prof. Mag. Dr. Bernhard Kittel, University of Vienna
- Univ. Prof. DDr. Thomas Lion, MSc, CCRI St. Anna (written interview)
- Stefanie Kirchner, MPH MSc PhD, Medical University of Vienna
- Dr. Julia Holzer, B.Ed. M.Sc., University of Vienna
- Mag.a Martina Lindorfer, ZSI
- Dr. Wolfgang Paster, CCRI
- Johannes Zuber, M.D., PhD, IMP
- Heinz Katschnig, MD, Univ. Prof., Medical University of Vienna
- DI Dr. Nikolas Popper, Vienna University of Technology
- Univ.-Prof. Dr. Jonas Puck, Vienna University of Economics and Business
- Univ. Prof. Rudolf Winter-Ebmer, JKU Linz

Appendix D Evaluation questions

- Was the process suitable for achieving the desired objectives and criteria, particularly in view of the short selection period?
- What are the special features and characteristics of the process?
- What observations can be made about the selected researchers and disciplines in terms of their ability to make a relevant contribution to the production of a broad range of empirical knowledge?
- What were the outcomes of the projects after their completion: further funding, new types of collaborations, reputation, continuation of work based on the data collected?
- Were the outcomes appropriate in relation to what can usually be expected from such funding activities?
- Can medium/long-term effects of funding within WWTF be identified (e.g. processes, understanding, calls, ...)?
- Can medium/long-term effects of the funding beyond WWTF be identified (broader research context, Viennese scientific landscape, network effects, cross-disciplinary cohort, science-public interface, ...)?
- Were there long-term effects on people, projects or institutions and observable changes: more visibility, faster processes, more effects,...?
- What can be learned from this particular call about common processes in other research funding instruments and procedures?
- Are there lessons that can be generalized for others?
- Are there other examples from which lessons can be learned?

Appendix E Network illustration including all labels

Figure 5 Network representation of the actors involved in the projects, full labels



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