



ERA Thematic Dossier

**„Health in Horizon 2020”
Analysis of the Austrian
Performance in the European
context**

Vienna, February 2018

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1 Introduction

This “ERA Thematic Dossier” takes a close look at Health research in Horizon 2020, and in particular on the Austrian performance related to Health research. This performance is analysed and evaluated in detail, and set into the European and national context. Based on this detailed assessment, several recommendations for action are proposed.

A first version of this dossier was published in 2015 (in German language). In this updated, 2nd version, not only data from the Horizon 2020 programme “Health, demographic change and wellbeing” as well as related programmes were taken into account, but also health-related projects from Pillar 1 “Excellent Science” were integrated and analysed, in order to get an extensive overview of health relevant research.

1.1 Data sources

All data in this dossier are based on analyses of data provided by the European Commission (EC). For IMI (Innovative Medicines Initiative), data were taken from the Qlikview- Database of the IMI Joint Undertaking. FFG points out that the results refer to a specific point in time, for this dossier the last data release from **30th of September 2017** was used. Horizon 2020 is continuously producing new data as a result of new calls, grant agreements etc. Some proposals retained for funding will not lead to a grant agreement and the next project on the reserve list will be considered. This may result in changes in the statistical data.

Data on health-related national funding through FFG is provided by FFG. Cut-off date for this analysis is 1st of January 2018. Only Austrian participants from projects that were signed between 2014 – 2017 are included.

This dossier provides a snap-shot of the current situation. While we made every effort to ensure accuracy of the information provided in this report, no liability can be accepted.

2 Executive Summary

- „Health, demographic change and wellbeing“ is the first of seven “Societal Challenges” (=SC1) in the third pillar of Horizon 2020, with a planned overall budget of 7,2 Billion € for the entire duration of Horizon 2020 (2014 – 2020).
- The first four years of SC1 had the overarching strategic priorities of “Personalising Health and Care” and “Personalised Medicine”. Over the first few years of SC1 calls, one could observe a rising influence of political agendas on the content of the calls. The EC is also engaging more in European and international strategic collaborations. Many of these platforms and networks play an important role for the selection and content of call topics.
- There are several important changes in comparison to the “Health” theme in the previous, 7th Framework programme (FP7), which influenced the Austrian performance. For example, the increased broadness of the topics, or a call structure based more on “health intervention logic” rather than specific diseases, or the orientation of the topics towards more applied research and innovation, away from “basic research”. The new, less prescriptive approach led and is still leading to insecurity and confusion amongst applicants whether their project ideas would fit to a call topic or not. On the other hand, due to the higher openness of the call topics, numbers of project applications in SC1 rose dramatically, leading to very low success rates and frustration amongst applicants.
- The two-stage system, which is often used in SC1, is well appreciated by Austrian applicants. However, during the first calls in 2014 and 2015 it was not implemented in a satisfactory way with very low success rates in Stage 2, which led to disillusionment.

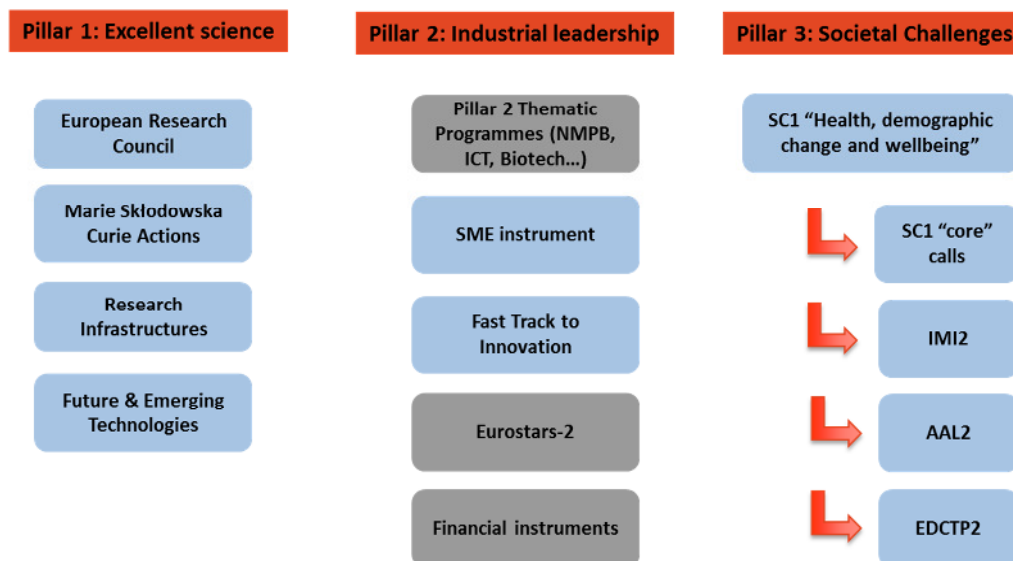
- Only at first glance is the overall SC1 budget higher than the Health budget in FP7. Since significant parts of the overall SC1 budget are designated for several other initiatives (public-public partnerships, public-private partnerships, SME instrument, Fast Track to Innovation, Infectious Disease Finance Facility, and others...), the budget for the “classic” collaborative projects, which are the favourite option for most researchers, has decreased in comparison to FP7.
- The overall Austrian performance in SC1 is until now satisfactory and in line with previous framework programmes, with the exception of the numbers successful coordinators. If only the “core calls” of Health are analysed, Austria has so far 96 successful participations, of which 6 are coordinators, and has attracted 44,5 Mio € of funding, which represents a share of 2,4% of the overall budget allocated so far in SC1.
- Concerning SC1 participations, Austria has a success rate of 11,5%, almost equal to the overall success rate of 11,7%. However, these success rates are slightly misleading and do not show the much more competitive reality for “classic” collaborative research projects, where the majority of applications lie, and which have much lower success rates.
- Austrian organisations are keen to participate in a project once invited, but are less keen to coordinate and scientifically lead a project and would rather leave this job to other countries. They appear to be well connected and invited to consortia. One main finding is however a strong decrease over the years in persons and institutions wanting to coordinate proposals, and also a strong decrease in successful coordinators. Possible reasons are diverse and are analysed in detail in this dossier.
- The most successful countries are the UK, Germany, Netherlands, France and Italy. The most successful organisations also mostly come from these countries, with some exceptions. Austria is well connected to these high performing countries.
- Other Horizon 2020 programmes also fund considerable parts of health research: all programmes in Pillar 1/“Excellent Science” as well as specific topics in the Pillar 2 Industrial Leadership.
- Many SMEs (small and medium sized enterprises) have shifted their focus to the much more attractive “single company funding” through the SME instrument. The interest in Austria for SC1 SME instrument projects was high, and so far 9 companies were successful with Phase 1 projects. Until now, no company managed to receive funding for a Phase 2 application, although many projects passed the evaluation threshold, but could not be funded because of limited budget.
- In IMI2 (Innovative Medicine Initiative) projects, Austrian participants are fairly well represented, but there is room for improvement. In total, 12 organisations from Austria participate in IMI2 projects and attracted funding of 5,5 Mio €.
- In the AAL (Active and Assisted living) programme, the community in Austria has been very effectively mobilised and is in addition highly successful in recruiting grants, with 83 successful organisations and 14 coordinators.
- In Pillar 1/“Excellent Science” of Horizon 2020, health-relevant research plays an important role. For example, many players use the ERC (European Research Council) for funding their basic research related to Health, and MSCA (Marie Skłodowska-Curie Actions) are an attractive alternative for funding mobility of younger researchers through doctoral training programmes, or Post Docs. Also in the Research Infrastructure and FET (Future and Emerging Technologies) programmes, health-related activities play a major role in Austria’s overall performance.

- Taking into account SC1, plus related public-public and public-private partnership programmes with EC funding, and health-related Pillar 1/Excellent Science projects, 154 Mio € of funding has so far been attracted by Austrian organisations.
- The two big national funding bodies relevant for Life Sciences and therefore health-related research are the FWF (Austrian Science Fund) and the FFG (Austrian Research Promotion Agency). Each year, more than 100 Mio € are spent by these two agencies on projects in biology and medicine in bottom-up calls. However, there is no matching national programme for Life Sciences or Medicine, whereas other Horizon 2020 areas have matching national programmes with strong national financial commitments, such as Energy, Information and Communication Technologies (ICT), Production, Transport, Security and others. A strong national thematic programme might on a short-term basis slow down the “capacities” to also apply for European funding, but in a long-term perspective probably strengthen Austrian participations in Horizon 2020 by developing thematic leadership in an area, and by setting the ground for project coordination also at European level.

3 Health Research in Horizon 2020

The following picture illustrates where Health Research is funded in Horizon 2020. **All areas in blue are considered and analysed in this dossier.**

Health research in Horizon 2020



3.1 Societal Challenge 1: Health, demographic change and wellbeing

3.1.1 Introduction to SC1

„Health, demographic change and wellbeing“ is the first of seven “Societal Challenges” (=SC1) in the third pillar of Horizon 2020, with a planned overall budget of 7,2 Billion € for the entire duration of Horizon 2020 (2014 – 2020), thereby representing the societal challenge with the highest budget.

SC1 aims to **“improve the lifelong health and well-being of all”**. Its main policy objectives are to improve health and well-being outcomes, to promote healthy and active ageing, to promote market growth, job creation and the EU as a global leader in the health area. In contrast to the

previous, 7th EU framework programme (FP7), SC1 in Horizon 2020 has also integrated ICT application-driven research in Health (i.e. ICT for Health/eHealth and ICT for Ageing).

Six strategic priorities are implemented within SC1 over the course of Horizon 2020, with the specific focus of each call changing slightly from call to call. Overall, funded projects under SC1 should contribute to:

1. Understanding health, wellbeing and disease => understanding diseases, and understanding the determinants of health; improving health promotion and disease prevention; improving surveillance and preparedness
2. Preventing disease => developing effective prevention and screening programmes and improving the assessment of disease susceptibility; improving diagnosis and prognosis; developing better preventive and therapeutic vaccines
3. Treating and managing disease => treating disease; transferring knowledge to clinical practice and scalable innovation actions
4. Active ageing and self-management of health => active ageing, independent and assisted living; empowerment for self-management of health
5. Methods and data => improving health information and better use of health data; improving scientific tools and methods to support policy making and regulatory needs; using in-silico medicine for improving disease management and prediction
6. Health care provision and integrated care => *promoting integrated care*

SC1 is one of the few remaining Horizon 2020 programmes that has not been externalised to an agency, but **is still implemented by the EC Directorates**, in this case jointly by Directorate E (Health) of DG RTD (Research and Innovation) and Directorate H.3 (eHealth, Well-Being & Ageing) of DG CNECT (Communications Networks, Content & Technology). The fact that SC1 is not implemented through external agencies has positive side effects, for example the relatively fast implementation of ad-hoc calls for the ZIKA Virus outbreak and the Ebola crisis through Horizon 2020.

3.1.2 Rising influence of European and Global political agendas

The first four years of SC1 had **the overarching strategic priorities** of “Personalising Health and Care” (2014/15) and “Personalised Medicine” (2016/17). These titles already reflect one of the major policies behind many call topics: personalised medicine, which is defined as prevention, diagnosis, and treatment tailor-made for individuals or groups of individuals.

Other important policies influencing the call contents are for example the Sustainable Development Goals of the United Nations (No 3: “Ensuring healthy lives and promoting well-being for all at all ages”), the Ostrava Declaration on Environment and Health policies, the Digital Single Market Strategy, the Cross border Health Directive, and others.

Over the first few years of SC1 calls, one could observe a **rising influence of political agendas as well as strategic collaborative networks** on the content of the calls (see also chapter 3.1.3). SC1 has, similar to other programmes, an Advisory Board, which gives recommendations when new calls are defined. In addition, SC1 is the only programme with an additional advisory body, the Scientific Panel for Health, a science-led expert group that has been tasked with helping to achieve better health and wellbeing for all by providing long-term visions for this area. A concrete influence on call topics of this panel has not been observed so far.

Small-and-medium-sized enterprises (SMEs) continue to be a strong political focus under Horizon 2020, and are therefore strongly encouraged to participate. SMEs can either engage in collaborative projects as part of a consortium or can be supported through the dedicated SME instrument designed specifically for highly innovative smaller companies. SC1, as well as many

other programmes of Horizon 2020, has set a specific budget aside for the SME instrument (see chapter 4.4).

3.1.3 Strategic collaborations and their influence on Horizon 2020 calls

Since Horizon 2020 (in some cases also since longer) the EC is engaging more in European and international strategic collaborations. Many of these platforms and networks play an important role for the selection and content of call topics (*see examples with =>*)

- **International Consortium for Personalised Medicine (ICPerMed):** an initiative established by over 30 European (incl. Austria) and international members representing research funders and policy-making organisations, together with the European Commission as observer, was officially launched in November 2016
 - ⇒ *topics with a focus on personalised medicine approaches have been part of the calls since 2014*
- **International Rare Diseases Research Consortium (IRDiRC):** teams up researchers and organisations investing in rare diseases research in order to achieve two main objectives by the year 2020, namely to deliver 200 new therapies for rare diseases and means to diagnose most rare diseases
 - ⇒ *over 800 Mio € have been invested in collaborative rare disease research in FP7 and Horizon 2020 plus national funding through ERA-NET projects. A major strategic EJP Co-Fund project for rare diseases is planned in 2018*
- **Global Research Collaboration for Infectious Disease Preparedness (GloPID-R):** network of funding organisations (incl. the EC) in the area of infectious disease preparedness research, aims to facilitate collaboration and coordination among funders so that a rapid and effective research response is ready to be deployed in the case of a significant outbreak
 - ⇒ *has played a role in several topics, for example the ZIKA Call (2016)*
- **Global Alliance for Chronic Diseases (GACD):** a global alliance of health research funders (incl. the EC); the aim is to develop and facilitate research collaborations between low- and middle-income and high-income countries in the fight against chronic diseases
 - ⇒ *GACD topics have been implemented every year in SC1, each year with a focus on a different disease area*
- **The European Innovation Partnership on Active and Healthy Ageing (EIP on AHA):** an initiative launched by the EC to foster innovation and digital transformation in the field of active and healthy ageing, that aims at bringing together all the relevant actors at EU, national and regional levels across different policy areas to handle a specific societal challenge and involve all the innovation chain levels. Austrian organisations participate in several initiatives.
 - ⇒ *several topics included priorities of the EIP on AHA*

3.1.4 Major changes compared to FP7

Apart from influence of policies and strategic collaborations, there are several other important changes in comparison to the “Health” theme in FP7. FP7 had a call structure partially based on disease areas, whereas **Horizon 2020 has a structure based on “health intervention logic”:** from understanding, prevention, to treatment and health care. Call topics, which used to be very specific for certain diseases in FP7, are now described in a **much broader way**, not addressing a specific disease, but rather stating an overall health goal, for example “New therapies for chronic

diseases”. This led and is still leading to insecurity and confusion amongst applicants whether their project ideas would fit to a call topic or not. At the same time, due to more openness of the call topics, **numbers of project applications in SC1 rose dramatically** at the beginning of Horizon 2020, leading to very low success rates and frustration amongst applicants.

Another change is the orientation of the topics towards **more applied research and innovation**, and away from “basic research”, for example away from disease mechanisms and fundamental biological questions. Topics for these types of research have almost completely vanished from SC1 calls, with only very few exceptions. In almost all remaining topics, some form of “validation” and a clear path to the market are required in the projects – validation for example through clinical research with patients, or through involvement of end-users in case of ICT in Health research projects. This new direction requires different project compositions and new types of applicants, a fact which Austrian applicants still face difficulties with.

The two-stage call system (⇒ Stage 1 short proposal between 6-10 pages, if successful, then invited to Stage 2/full proposal) was already implemented under Health in FP7, and was again used since the beginning of Horizon 2020. The two-stage system as such is well appreciated by Austrian applicants, but during the first calls in 2014 and 2015 was not implemented in a satisfactory way. Far too many proposals were invited by the EC to proceed to Stage 2 and therefore the success rates were very low, sometimes as low as 5% even in Stage 2. Although these issues have in the meantime been addressed by the EC through the implementation of a “dynamic threshold” in Stage 1 from 2016 onwards, many people are still sceptical due to their experiences made in the first two years.

3.1.5 Overall a higher SC1 budget, but less for collaborative projects

Only at first glance is the overall SC1 budget higher than the Health budget in FP7. Since **significant parts of the overall SC1 budget are designated for several other initiatives** (1.638 Mio € to IMI2, 683 Mio € to EDCTP2, 175 Mio € to AAL, 257 Mio € budgeted to the SME instrument so far, 35 Mio € to Fast Track to Innovation, 100 Mio € to the “Infectious Disease Finance Facility, and others...), the **budget for the “classic” collaborative projects**, which are the favourite option for most researchers, **has decreased** in comparison to FP7. All SC1 calls of the first 4 years 2014 - 2017 had a significantly lower budget for collaborative projects than the FP7 calls, and in addition large single initiatives such as the European Joint Programme on Human Biomonitoring with an EC contribution of 50 Mio € were part of the normal calls. For the last 3 years 2018 – 2020 of Horizon 2020, budgets are supposed to rise again, but still not reaching call budgets of FP7.

In addition to the budgetary contributions to IMI2, EDCTP2 and AAL, **several other public-public partnerships** such as Joint Programming Initiatives and ERA-NETs are also indirectly supported by the EC via Co-Fund activities, or funding of their network activities through CSAs.

Austria participates in several health-related Joint Programming Initiatives and ERA-NETs with national funding.

3.1.6 Results of Interim Evaluation of SC1

The Horizon 2020 interim evaluation carried out in 2017 could not yet assess the full impact of SC1, but showed that **SC1 is on track to deliver on its main objectives**. The only area where certain difficulties in implementation were observed was in projects with clinical studies, since consortia tended to underestimate the undertaking required by major multi-partner international studies. However, main consequences are mostly limited to delays which can often be solved by extending the duration of a project, similar to FP7.

3.2 Health-related multilateral programmes

As mentioned above, SC1 is also implemented and contributes with budget to the Innovative Medicines Initiative 2 (IMI2), the European & Developing Countries Clinical Trials Partnership (EDCTP2) and the Active and Assisted Living Programme (AAL).

- **The Innovative Medicines Initiative 2 (IMI2)** is Europe's largest public-private initiative aiming to accelerate the development of better and safer medicines for patients. It is a joint undertaking between the European Union and the European Federation of Pharmaceutical Industries and Associations (EFPIA) supporting collaborative research projects and building networks of industrial and academic experts in order to boost pharmaceutical innovation in Europe.
- **The European & Developing Countries Clinical Trials Partnership 2 (EDCTP2)** is a public-public partnership between countries in Europe and sub-Saharan Africa, and the European Union. It aims to accelerate the development of new or improved drugs, vaccines, microbicides and diagnostics against HIV/AIDS, tuberculosis, malaria and neglected infectious diseases in sub-Saharan Africa. Austria is participating in EDCTP 2, but has so far no successful participations. EDCTP is therefore not included in any more analyses in this dossier.
- **The Active Assisted Living Programme (AAL 2)** is a public-public partnership between the EU and several European countries. It aims at creating better conditions of life for older adults and to strengthen the industrial opportunities in Europe through the use of ICT.

3.3 Health research in other areas of Horizon 2020

3.3.1 Pillar 1 “Excellent Science” and Pillar 2 “Industrial Leadership”

SC1 and the related partnerships cover a large part of health-related research in Horizon 2020, **but other Horizon 2020 programmes also fund considerable parts:** all programmes in Pillar 1 (ERC, MSCA, FET, Research Infrastructures) as well as specific topics in Pillar 2 (Industrial Leadership) programmes such as ICT (for example on Robotics in Healthcare), NMBP (for example on materials for regenerative medicine) and Biotechnology (for example some topics on Synthetic Biology, bioinformatics).

In addition to SC1 and the related programmes, **this dossier also analyses the results for Pillar 1 in health research**, whereas health-related topics of Pillar 2 are omitted from analysis, because these are singular topics in a wide range of calls, which makes such an analysis practically not feasible.

The **SME Instrument** covering the Health topics with budget from SC1 is analysed in Chapter 4.4.

SC1 has also contributed to the **“Fast Track for Innovation”** (FTI) Programme of Horizon 2020, so far with around 35 Mio €. FTI is a fully-bottom-up innovation programme promoting close-to-market activities open to industry-driven consortia that can be composed of all types of participants. Budgets coming from thematic programmes of Horizon 2020 are pooled in a common pot, and keywords/thematic areas are assigned to submitted projects. Results are not presented according to thematic areas, but in one concerted ranking list. The EC has performed some basic analysis of FTI for Health research, and some results will be presented in Chapter 4.5.

3.3.2 European Institute of Technology

The European Institute of Innovation and Technology (EIT) is officially part of Horizon 2020, but functions as an independent EU body. It was set up in 2008 with the aim of transforming education and research results into commercial innovation opportunities, and fostering entrepreneurial spirit of young researchers across Europe. The EIT was the first European

initiative to fully integrate the three sides of the "**Knowledge Triangle**" (**Higher Education, Research, and Business/Innovation**). EIT's activities are delivered through operative partnerships known as "**Knowledge and Innovation Communities**" (**KICs**), which are highly integrated public-private networks of universities, research organisations and businesses. KICs have Co-location Centres spread across the EU and work with regional centres to increase the impact of their activities.

So far, KICs in six different areas have been implemented, one of them in the area of Health, with the aim of improving both quality of life for European citizens and sustainability of health and social care systems, a goal very similar to that of SC1. The EIT Health was established at the end of 2014 and is a consortium of more than 50 core partners and 90 associate partners from leading businesses, research centres and universities from across 14 EU countries. It has set quantitative goals, such as creation of 70 start-ups per year by 2018, 1.000.000 students taking part in its educational online programmes per year by 2018, and incubating approximately 80 – 140 new businesses per year.

Austria does so far not participate in the EIT Health.

4 Austria's Performance for Health research in Horizon 2020

Summary – Austrian performance in Health-related research in Horizon 2020

Societal Challenge 1 "Health": 96 participations - 6 coordinators –44,6 Mio € funding

Pillar 1 "Excellent Science"

- MSCA- Marie Skłodowska-Curie actions: 60 participations –13,9 Mio € funding
- ERC – Health-related projects: 29 ERC grants - 61 Mio € funding
- FET – Health-related projects: 9 participations - 6,2 Mio € funding
- Research Infrastructures – Health-related projects: 14 participations – 2 coordinators - 5 Mio € funding

SME Instrument Health: 9 Phase 1 projects - 0,45 Mio € funding

Fast Track to Innovation – Health-related projects: 4 participations – 1,6 Mio € funding

Related partnership programmes

- IMI2: 12 participations - 5,5 Mio € funding
- AAL: 83 participations – 14 coordinators – 15,4 Mio € funding (mix of national and European funding)
- EDCTP 2: no projects with Austrian participation so far

⇒ **In total, 154 Mio € of funding has been attracted from Austria in Health-related projects so far!**

4.1 Societal Challenge 1 – 4 years of calls (2014 – 2017)

4.1.1 Overview of statistics and success rates

For the quantitative analysis, we distinguished participation in "normal/core" SC1 calls (collaborative projects ⇒ SC1 in the table) from participation in the SME-Instrument (SC1 SME) and in IMI2.

Table 1: Key Figures of Austria's performance in SC1 (only full proposals, not Stage 1)

	Austria			Total			Share of Austria %
	Evaluated	Funded	Success rate %	Evaluated	Funded	Success rate %	
SC1 Participations	837	96	11,5%	35.081	4083	11,7%	2,4%
SC1 coordinators	88	6	6,8%	3367	337	10%	1,8%
SC1 EC contribution (in Mio €)	435	44,6	10,2%	17.226	1831	10,6%	2,4%

Source: eCORDA data as of 30/09/2017, diagram: FFG

If only the “core calls” of Health are analysed, Austria has so far 96 successful participations, of which 6 are coordinators, and has attracted 44,5 Mio € of funding, which represents a share of 2,4% of the overall budget allocated so far in SC1. This is a satisfying number after 4 years, especially considering that call budgets were relatively low in the first years and will increase in the last years. In FP7, over the entire duration, 117 Mio € of funding was attracted to Austria, representing the same share of 2,4%. Therefore, overall performance considering recruited funding is until now satisfactory and completely in line with previous framework programmes.

Looking also at the number of unsuccessful attempts, so far 837 participants including 88 coordinators have applied, but were unsuccessful. These numbers increase substantially if one also takes Stage 1 applications into account: an additional 102 Austrian coordinators were already rejected in Stage 1, and do not appear anymore in the overall statistics. **Therefore, in total, almost 200 Austrian coordinators have so far tried to attract funding in SC1.**

Especially the first calls in 2014 were very attractive to the Austrian community: in 2014, 107 coordinators applied for project grants, of which 80 were already rejected in Stage 1. **These numbers have decreased substantially over the call years**, and 2016 only 32 coordinators applied (20 rejected in Stage 1).

The first main finding is therefore a strong decrease over the years in persons and institutions wanting to coordinate proposals, and also a strong decrease in successful coordinators. In comparison, in FP7 Health there were overall 36 successful Austrian coordinators (share of 3,6% of total), in Horizon 2020 so far only 6 successful coordinators (share of 1,8% of total). Possible reasons for the changes in numbers of coordinators are analysed below in Chapter 4.1.2.

Even if numbers of coordinators are decreasing, one has to stress that this does not affect the overall Austrian performance concerning participations and budgets – these are in a good, stable range, and are satisfactory.

Table 2: Successful Austrian Coordinators in SC1

Call	Organisation
2014	Medical University Innsbruck
2015	Medical University of Vienna
	EIBIR (European Institute for Biomedical Imaging Research) TECHNIKON Forschungs- und Planungsgesellschaft mbH
2016	EIBIR (European Institute for Biomedical Imaging Research)
2017	Medical University of Vienna

Source: eCORDA data as of 30/09/2017, diagram: FFG

4.1.1.1 Success rates

Although the **overall success rate of 11,7%** based on successful participations in SC1 seems adequate in the overall context of Horizon 2020 and **Austria is completely in line with a success rate of 11,5%**, these numbers are slightly misleading and do not show the much more competitive reality for classic research projects, where the majority of applications lie. **For most Research and Innovation Actions, the success rate based on successful projects still only lies at 5 - 10%** (for full proposals, i.e. single stage and Stage 2), for Coordination and Support Actions in average at 25%, and even higher for instruments such as ERA-NETs, PCP and PPIs (sometimes close to 100%). Especially in the first two call years, the success rates for Research and Innovation Actions were very low. In recent years the situation has at least improved in Stage 2 of two stage calls due to the introduction of the so-called “dynamic thresholds” since 2016.

The success rates also differ as regards the two DGs that are contributing to SC1: for DG CNECT topics, the overall success rate for projects is 6,7%, for DG RTD 14,8%. This is largely due the fact that DG CNECT implements all topics via single stage procedures, whereas DG RTD uses two stage calls whenever appropriate, therefore boosting the overall success rates due to a higher success rate in Stage 2. Austrian success rates are in line with these overall rates, with 4,2% for DG CNECT, and with 16,1% for DG RTD.

Compared to FP7, the success rates have strongly declined, showing on the one hand the higher attraction of the call topics, but on the other hand the severe competitiveness of Horizon 2020. For participations, success rates used to be around 28% in FP7, almost triple the current rates, and based on the number of funded projects (i.e. coordinators), single stage calls had success rates of 20%, at least double of current rates. Austrian success rates were always higher than average.

4.1.1.2 Successful Austrian organisations

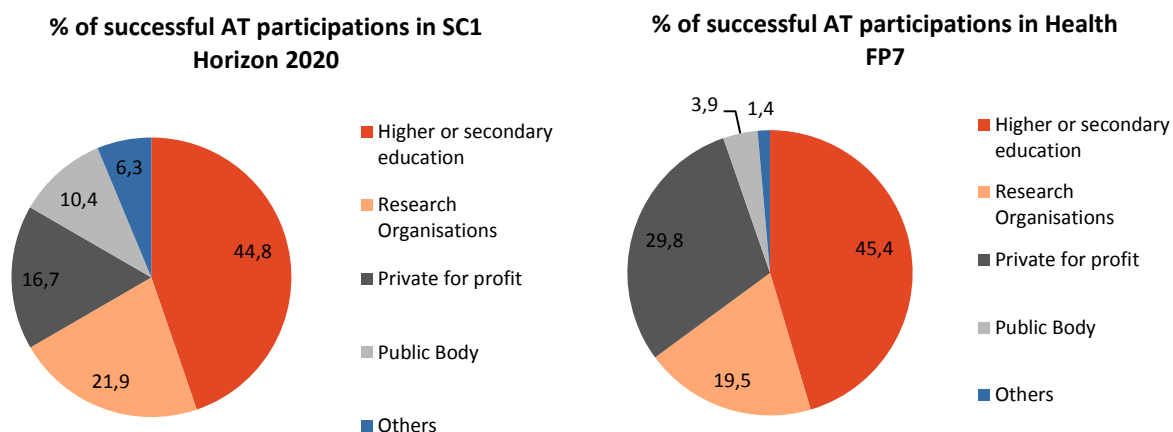
The Top 10 successful organisations in Austria (Table 3) represent a **good balance of public and private universities, research organisations, as well as two agencies**, FWF and FFG. The most successful organisation is the **Medical University of Vienna**, and also the most active Austrian organisation when it comes to applications as coordinators, including unsuccessful ones (data not shown).

Table 3: Top 10 successful Austrian organisations, ranked by participation

Name of organisation	No of successful participations
Medical University Vienna	14
Medical University Innsbruck	8
Medical University Graz	8
AIT Austrian Institute Of Technology Gmbh	7
FWF – The Austrian Science Fund	6
EIBIR (European Institute for Biomedical Imaging Research)	4
Paracelsus Medical Private University	3
UMIT - Private University for Health Sciences, Medical Informatics and Technology	3
FFG – Austrian Research Promotion Agency	2
Ludwig Boltzmann Gesellschaft GmbH	2

Source: eCORDA data as of 30/09/2017, diagram: FFG

It is also interesting to look at the **type of organisations** participating from Austria in successful projects, and if there has been a change from FP7 to Horizon 2020.



Source: eCORDA data as of 30/09/2017, diagram: FFG

Interestingly, **the situation for universities and research organisations has stayed stable**, with universities representing the majority with around 45% and research organisation with around 20%. However, the participation of **private for profit companies (including SMEs) has gone down** from 30% to 17%, whereas the percentages of public bodies (for example ministries, FWF or FFG in ERA-NET projects or NCP projects) and “others” has increased. Concerning the decrease of the share of private companies in successful projects, one explanation is that many SMEs have shifted their focus to the much more attractive “single company funding” through the SME instrument. However, when looking at the share in rejected applications, this number is higher (26% are private for profit), so many companies do try, but simply don’t make it anymore through the very competitive evaluation procedures. Until now, 10 SMEs have tried to coordinate collaborative SC1 projects, and so far 1 of them was successful (TECHNIKON Forschungs- und Planungsgesellschaft mbH).

4.1.2 Analysis and possible explanations for Austria’s performance

4.1.2.1 Why are numbers and success of coordinators decreasing?

As mentioned above, there was very high interest at the beginning of Horizon 2020 in Austria – researchers liked the more open approach and calls seemed very attractive thematically, covering a broad range of project ideas. The interest was especially high in two-stage calls, where most Austrian project proposals were submitted. However, after the first round of calls with very low overall success rates, including low success rates even in Stage 2 down to 5%, many researchers were frustrated by the high competition and low success rates, and in general by the two-stage evaluation procedures. Low success rates have also been the case for many single stage topics, therefore the overall interest has gone down over the past years. Thus, **one of the main reasons for a decreasing number of coordinators is the very low overall success rate, combined with disillusionment** over the years. As a consequence, although the less prescriptive approach in SC1 was considered as the way forward at the beginning of Horizon 2020, in the meantime, at midterm Horizon 2020, many researchers “miss” the former, thematically narrower calls in FP7.

Concerning the low success rates of Austrian coordinators, one explanation might also be that call topics have become more and more “applied”, which is less attractive for Austrian researchers. Lots of Austrian coordinators who were successful in FP7 are active in basic research or in preclinical research at medical universities, for example studying disease mechanisms, but are not involved much in clinical research with patients. Some of these coordinators tried to submit projects in the first calls of Horizon 2020, but failed because the project proposals were

not “applied” enough. We observed that many of the former active and experienced FP7 Health players have therefore shifted their focus to funding instruments of Pillar 1 “Excellent science”, especially to ERC grants. Others are also diversifying away from SC1, for example those who are closer to medical technology have been applying more to Pillar 2 (ICT and NMBP), or others are trying more in the bottom up parts of the FET programme. Some have also simply “given up” and are not applying at all anymore.

In addition, especially in the last two calls and in the upcoming calls of 2018 and 2019, the image of a **more “political programme”**, with less research calls, but lots of CSAs (to support European policy) or procurement instruments “scares” researchers off. Many applicants have difficulties dealing with the fact that Horizon 2020 is more “political” than FP7 and that excellent science is not enough anymore. This does not only mean that policy issues are behind many topics or are implemented through non-research topics, but also that for example the project proposal chapter on impact has become even more important. Small “business plans” have to be presented in proposals, open access and open data have to be considered, patient groups should be part of a consortium, and many other horizontal issues have to be taken into account. **Many applicants had difficulties addressing these non-scientific issues adequately in their proposals, which reduced the overall proposal quality and lead to lower scores.** FFG continues its efforts to consult and train on these non-scientific issues, for example through proposal checks and the FFG Academy Trainings.

Feedback from the community was also that call topics have unrealistic expectations and are expecting projects to cover “everything” without increasing the funding per project: from development to prototype, from basic research to clinical implementation or other types of validation involving end-users to maximise the impact as much as possible. **Many applicants hesitate to even write project proposals because they fear that they cannot fulfil these expectations.**

However, one has to stress that the majority of Austrian coordinated proposals is below the overall evaluation threshold (70% in total, and 86% in stage1!) – meaning they did not pass the first, or all of the thresholds in the three evaluation criteria (1. Excellence – 2. Impact – 3. Implementation). As scientific and technological excellence is the 1st evaluation criterion and is often correlated with the 2nd and 3rd criterion, **this strongly indicates that the scientific and technological excellence of the Austrian proposals was in most cases simply not good enough.**

As mentioned before, Horizon 2020 is targeted more towards strong clinical expertise; therefore, medical doctors/clinicians are one of the main target groups of coordinators. An additional reason for decreasing numbers of coordinators, maybe specific for Austria, is the fact that at Austrian medical universities, **clinicians do not have the time to set a priority on coordinating an EU project and spending a lot of time on research.** Due to the new “Arbeitszeitgesetz” (since beginning of 2015, affecting calls with deadlines from 2015 onwards) clinicians are under much stricter control of their working time in Austria, and at the same time they face ever increasing demands in patient care, and also in teaching. Research is often the last priority, and to coordinate a Horizon 2020 proposal a clinician would have to be freed from normal work duties to take the time for writing, but more important, to implement a project when successful. With average success rates of 5%, this is a very risky undertaking, which many universities are not willing to take any more, unless the pressure for external research funding is very high.

Interestingly, **most of the six successful Austrian coordinators in SC1 have worked together with professional consulting organisations** to write their proposals, for two reasons: to fulfil the demand for a more and more “professionalized” proposal, which addresses the whole range of aspects besides the scientific excellence, and secondly because they don’t have the personnel resources and capacity to write a proposal. This **trend of professional support** can be observed all over Europe, but presents an expensive trend. Coordinating institutions have to be able to finance this support, and many don’t have the financial capacities to do this.

In conclusion, numbers of successful coordinators are the one statistical number that has significantly changed. One could argue that as long as overall participation and funding continue to be strong, this is not too problematic. **However, coordination is not only about monetary funding, but also about thematic leadership and networking in a certain field, and about reputation and prestige in Europe. Therefore, efforts on increasing this number should be continued.**

4.1.2.2 Interest to participate in projects is still high

Due the situation analysed above, many applicants are now choosing the strategy to rather go in as a project partner instead of trying to coordinate a project, since the funding portion is often similar. **There is no general disinterest in Horizon 2020, in contrast:** after 4 years of Horizon 2020 with reduced call budgets compared to FP7, we have nearly reached the number of evaluated participations from FP7: from 2014 to 2017 there were 837 evaluated participations in Horizon 2020 (excluding Stage 1), compared to 1025 in total for 7 years of FP7. **In conclusion, the mobilisation of organisations to participate in the calls and raising interest is working in Austria and not a problem.**

The numbers for participations are even excluding unsuccessful 1st stage applications, since statistics on this were only introduced in 2016 (since 2016 every participant registers in the online system and is thus included in the statistics of evaluated participations). Since both in FP7 and in the first two Horizon 2020 call rounds 2014 and 2015 these numbers were not provided and participants who applied unsuccessfully in Stage 1 remained unknown and statistically “in the dark”, we decided to also not include these in the overall statistics of Table 1.

It therefore appears that Austrian organisations are still keen to participate in a project once invited, but are less keen to coordinate and scientifically lead a project and would rather leave this job to other countries. But they appear to be well connected and invited to consortia.

4.1.3 Interesting facts for Europe

4.1.3.1 Top 10 successful countries and organisations

In this context, it is interesting to look at the most successful countries and the most successful organisations so far in SC1 (Table 4). Not surprisingly, the “big four” countries in Europe (France, Germany, Italy and the United Kingdom) are also the most successful countries in SC1, both in number of participations and in the EC-contribution. One exception in the Top 5 is the Netherlands, which is not a “big four” country, but has been traditionally very strong in SC1. Austria ranks No 10 for funding and No 12 for participations, a position very similar to previous years and programmes.

Austria is well connected to these most successful countries. In the funded projects with Austrian participation, the coordinators are in most cases from Germany, followed by the Netherlands, UK, Italy and France. The same goes for partners in the projects: most partners in projects with Austrians are from Germany, followed by UK and Netherlands. It remains to be seen how the BREXIT will affect UK participation in SC1 projects, as it is the most successful country in SC1.

Table 4: Top SC1 countries, ranked by EC contribution and by number of successful participations

Country	EC-contribution	Country	No of successful participations
1. UK	308.9 Mio €	1. UK	526
2. Germany	267.4 Mio €	2. Germany	501
3. Netherlands	221.8 Mio €	3. Italy	371
4. France	172.9 Mio €	4. Netherlands	359
5. Italy	143.7 Mio €	5. France	352
6. Spain	139.5 Mio €	6. Spain	342
7. Belgium	89.3 Mio €	7. Belgium	205
8. Sweden	74.3 Mio €	8. Sweden	138
9. Denmark	56.1 Mio €	9. Denmark	121
10. Austria	44.6 Mio €	10. Greece	110
11. Greece	40,5 Mio €	11. Switzerland	110
12. Finland	33,3 Mio €	12. Austria	96

Source: eCORDA data as of 30/09/2017, diagram: FFG

Regarding the **Top 10 organisations** in Europe (Table 5) with respect to attracted funding, not surprisingly this list is led by universities from the UK. In addition, INSERM, three universities in the Netherlands, the Swedish Karolinska Institute and the University of Leuven in Belgium fill this list. In comparison, the Medical University Vienna is in position No 30. **The most successful performers in SC1 represent strong and big universities and organisations, with a history of high performance, and substantial organisational support** for grant writing and grant management, a situation which is mostly not comparable to Austrian universities. Interestingly, success in recruited funding does not necessarily mean a high number of coordinators – e.g. the most successful organisation, the University of Oxford, has attracted the highest funding, but has only 3 coordinators.

Table 5: Top 10 organisations, ranked by EC contribution; Numbers of participations and of coordinators also shown

Name of organisation	Country	EC contribution	No of Participations	No of Coordinators
1. University Of Oxford	UK	31.3 Mio €	25	3
2. Imperial College	UK	29.6 Mio €	19	7
3. University College London	UK	28.3 Mio €	34	8
4. INSERM	FR	27.9 Mio €	47	9
5. Karolinska Institutet	SE	27,2 Mio €	40	5
6. Academisch Ziekenhuis Leiden	NL	21.9 Mio €	24	6
7. Erasmus Universitair Medisch Centrum Rotterdam	NL	21.2 Mio €	26	6
8. Stichting Katholieke Universiteit	NL	20.5 Mio €	20	3
9. Katholieke Universiteit Leuven	BE	15.1 Mio €	27	3
10. University Of Cambridge	UK	14.3 Mio €	19	1
(30. Medical University Vienna)	(AT)	(7.5 Mio €)	(14)	(2)

Source: eCORDA data as of 30/09/2017, diagram: FFG

4.2 SME Instrument in SC1

4.2.1 Introduction

The SME instrument was launched with the beginning of Horizon 2020. It supports close-to-market activities, with the aim to give a strong boost to breakthrough innovation with a market-creating potential. Highly innovative SMEs with a clear commercial ambition and a potential for high growth and internationalisation are the prime target. The SME instrument has three phases, plus a coaching and mentoring service. For Phase 1 and Phase 2, there are four Cut-Off dates per year.

- **Phase 1** - Feasibility study: to develop a ground-breaking, innovative idea into a credible business plan for scaling it up: projects will receive a lump sum of 50.000 € and should last around 6 months.
- **Phase 2** – from concept to market: helps to develop the business concept into a market-ready product, service or process. Projects will receive up to 2,5 Mio € (exception in some SC1 topics from 2014 – 2017: up to 5 Mio €!), and normally last 1- 2 years
- **Phase 3** - Business acceleration services and coaching

The general approach of the EC was to have a bottom-up, thematically open approach for calls of the SME instrument. SC1 was the only Horizon 2020 programme that did not offer bottom up topics, but introduced **concrete thematic topics for the SME instrument calls**. The main reason for this approach of SC1 was to avoid high oversubscription and very low success rates. This limited which SMEs could apply for the SC1 SME instrument topics: only SMEs active in the areas of biomarkers, diagnostic medical devices, cell technologies in medical applications, and e-health could so far apply for funding.

With the introduction of the European Innovation Council (EIC) pilot at the end of 2017, this has now changed, and **since January 2018, there are not thematic topics anymore, and calls of the SME Instrument as part of the EIC are completely bottom-up.**

4.2.2 Austrian Performance in the SME Instrument

Table 6: SME Instrument Numbers Phase 1 and Phase 2

	Austria				Total			
	Evaluated	Above threshold, below budget	Funded	% Success rate	Evaluated	Above threshold, below budget	Funded	% Success rate
Phase 1 No of Projects	40	5	9	22%	3025	292	291	9,6%
Phase 2 No of Projects	28	16	0	0%	2297	1022	86	3,7%

Source: eCORDA data as of 30/09/2017, diagram: FFG

The interest in Austria for SC1 SME-instrument projects has been high since the beginning, and so far 9 companies were successful with Phase 1 projects, with a very good success rate of 22%. As every Phase 1 project receives a lump sum funding of 50.000 €, the 9 successful projects add up to a total funding of 0,45 Mio € for Austria, which represents a 3,1% share of the so far allocated budget.

So far, no company managed to receive funding for a Phase 2 application, although 16 projects passed the evaluation thresholds and were of high quality, but could not be funded because of limited available budget.

Despite the approach with thematic topics for the SC1 SME instrument, success rates at European level were very low in both phases, on average 9,6% for Phase 1, and 3,7% for Phase 2 in SC1. In particular the e-health topic of SC1 attracted many applicants, resulting in extremely high oversubscription and very low success rates (for example 0,69% for Phase 2 at the last Cut-off Date). This was also due the fact that less budget was allocated to this topic in comparison to others and just one project could be funded per Cut-off date.

As mentioned above and shown in table 6, **a high number of Austrian, but also European SMEs pass the evaluation thresholds, but could not be funded** because of budgetary limitations. For these SMEs, the **“Seal of Excellence”** was introduced by the EC in 2015. This “Seal of Excellence” is awarded to all proposals above threshold, acknowledging their high quality and excellent ideas. It is up to the national governments to provide funding solutions for these “Seal of Excellence” projects. In Austria, especially funding for Phase 1 “Seal of Excellence” projects remains for now an unsolved issue and there are no adequate financial options available to fund these projects with similar funding rates and conditions as the EC.

Because one of the most important alterations of the SME Instrument for the years **2018-2020 is a bottom-up approach without any thematic restrictions** for all thematic areas, all SMEs from the Health-related sector now have the opportunity to participate. With a common budget of more than 1,6 Billion € for all projects it remains to be seen if oversubscriptions and success rates will differ compared to thematic topics and the experiences made so far.

Moreover, for the years 2018-2020 a minimum of **Technology Readiness Level (TRL) 6** for phase 2-projects is mandatory, and this in turn might exclude activities that so far were part of successful phase 2 SC1 SME instrument projects, such as preclinical studies, *in vivo* demonstration activities and validations in laboratories and relevant environments.

4.3 Fast Track to Innovation

As mentioned above (chapter 3.3.1), results for FTI are difficult to analyse, because they are not presented according to thematic areas, but in one concerted ranking list. However, the EC has recently presented an internal thematic analysis for FTI health projects, and therefore some data can be shown. Overall, in the two FTI pilots from 2015 and 2016, 94 projects were funded, and **17 of these were health-related projects**, so almost 20%. In these 17 successful Health projects, there are **4 participations from Austrian organisations, with a funding of 1,6 Mio €**, representing a share of 4% from total funding, which is a success. So far, no Austrian coordination was successful.

4.4 IMI2 – Innovative Medicines Initiative

4.4.1 Key Figures for IMI2

Table 7: Key Figures for IMI2

	Austria			Total			Share of Austria %
	Evaluated	Funded	Success rate %	Evaluated	Funded	Success rate %	
IMI2 Participations	36	12	33%	1642	516	31%	2,3%
IMI2 EC contribution (in Mio €)	19,4	5,6	29%	1019	471	46%	1,2%

Source: eCORDA data as of 30/09/2017, diagram: FFG

The interest for IMI2 among Austrian scientists is high. This may be predominantly due to the nature of the topics, which are in general very basic/clinical research-oriented and deal with defined diseases, and therefore cover a gap left by the topics of SC1. IMI2, the successor

programme of IMI1 (2008-2013) and running from 2014 to 2024, usually opens 2 calls a year with varying numbers of topics. Most of the rules for participation of Horizon 2020 also apply to IMI2, with one major exception lying in the selection procedure of short proposals, since only one project per topic is being funded. This causes statistical figures such as success rates not to be directly comparable between Horizon 2020 SC1 and IMI calls and therefore need to be cautiously interpreted.

4.4.2 Austria's performance in IMI2

Although Austrian participants are fairly well represented in IMI2 projects, there is still considerable room for improvement. Statistics available to date cover calls 1-9 (2014-2016). According to these, organisations from Austria are taking part in a quarter of all IMI2 projects granted so far (10 out of 38). In total, 12 organisations from Austria are represented in these projects and attracted funding of 5,6 Mio €. With 6 participations, the Medical University of Vienna (MUW) represents the most successful Austrian organisation, followed by the University of Vienna with 2 participations. In total, 36 organisations from Austria have applied for IMI2 grants. The success rate of 33,3% is well in line with the overall IMI2 success rate of 31,4%. However, the relative EC funding of 1,2% for Austria (in relation to total EC funding) is low and has slightly decreased from IMI1 (1,3%) to IMI2.

4.4.3 From IMI1 to IMI2

While the main scope of IMI1 topics lied in efficiency and safety issues of drug development, in IMI2 this scope **was extended to the entire drug development chain**. Another major change from IMI1 to IMI2 consisted in simplification of project submission and implementation by adapting underlying procedures to Horizon 2020 rules. These changes would suggest stronger mobilisation of the relevant scientific community, eventually resulting in a higher number of proposal submissions in IMI2 as compared to IMI1. Interestingly, the opposite tendency could be observed: to date, less than one third of organisations have applied to IMI2 calls than did in IMI1 (total number of IMI1 applicants: 5.357), even though the operative duration of IMI2 (last calls to be expected in 2020) is already halfway. This tendency is also reflected in Austrian applications, where it is even more pronounced. The main reason for this tendency lies in a **general disillusionment concerning IMI** after the first round of this programme, with experiences showing how difficult it is to get a project granted. The concept of funding only one project per topic certainly adds to this mind-set.

4.4.4 SMEs in IMI

The Interim Evaluation Report for IMI2 (2014-2016) highlighted that SME participation was already rather low in IMI1 (16%) and further decreased to <12% in IMI2. Also, it was lower than in Horizon 2020 initiatives (without SME-specific instrument and IMI2) in terms of participation and funding, respectively. In Austria, these figures are even lower: only 3,1% (4) of Austrian organisations participating in IMI1 projects are SMEs, and there are none yet in IMI2 projects.

Several reasons have been identified for this **restraint of SMEs to participate in IMI projects**, pointing to the need of providing more flexibility as regards intellectual property rights for project results generated in IMI projects; rendering topic descriptions less prescriptive and less top-down determined by large industry; and addressing SMEs from other sectors than pharmaceutical.

4.4.5 Experiences from Austria with IMI

As revealed by consultations with potential applicants from Austria, **IMI projects are perceived as too large and complex**, rendering the lead of proposal development unappealing. Also, the criticism of IMI being a **“closed club”** is often heard. On the other hand, there is high interest in participating in IMI projects without having to take over the lead.

Apart from the few cases where Austrian organisations have the confidence of leading a project proposal, the only possibility for participating in IMI projects therefore lies in finding their way into the “winner consortium”. The most effective way is to use existing contacts. These also include contacts to EFPIA members that are usually established through collaborations with researchers and clinicians regarding different stages of drug development (e.g. pre-clinical and clinical validations). Due to the fact that there are only very few EFPIA companies with research departments located in Austria, such collaborations are not as easily established as in countries with high numbers of large pharmaceutical companies such as the UK and Germany, and therefore need to be more proactively sought for.

Those **scientists from Austria being involved in running IMI projects very much appreciate the cooperation opportunities** with EFPIA companies and with other academic groups and are keen to use these contacts for successor project proposals as well as future bilateral collaborations. In personal interviews lead by FFG, more than 90% of Austrian IMI project participants reported of having substantially benefitted from this opportunity.

4.5 AAL – Active Assisted Living Programme

The Active Assisted Living Programme is a **success for Austria**. From 2014 – 2017, there were in total 83 successful Austrian participations incl. 14 coordinators, with a funding by FFG of 15,4 Mio € (mix of national and European funding). **Austria is very active in AAL:** as examples, in 2016, Austria was the 3rd active country (behind NL and CH) in submissions and also in successful participations. In 2015, Austria was the No 1 active country in evaluated coordinators, and 11 out of 14 coordinators were successful in the end. The Austrian success rate for participations is 34%. **Therefore, the community in Austria has been very effectively mobilised and is in addition highly successful in recruiting grants.** One major reason for this success is the parallel implementation of **the national “benefit” funding programme**, which also funds development of products, systems and services based on ICT technologies to maintain and improve the quality of life of older adults. Especially at the beginning, numerous small projects and studies helped to establish the community in Austria in this area. ¹

However, one must note **several major differences to SC1 calls in Horizon 2020**, which makes it difficult to directly compare the performance in the two programmes:

- “Big” countries such as Germany, France and UK are NOT part of the AAL programme, therefore making it more successful for smaller member states
- the success rate is much higher, which makes the programmes more attractive: 2016 was an overall project success rate of 46%, in 2015 of 65%, almost six times as high as in Horizon 2020
- AAL projects are very close to the market; projects should have a time-to-market perspective of maximum 2 to 3 years after the end of the project, a realistic trial set-up at the end of the project and involve end-users throughout the life of the project. Although Horizon 2020 SC1 collaborative projects also aim at involving end-users in projects, they are still earlier in the product pipeline and are rarely ready to go into the market soon after the project ends

In conclusion, AAL is a success story for Austria, but this does not necessarily mean that this applicant community can be easily mobilised and “transferred” to the SC1 “ICT for Health” Horizon 2020 calls due to the different program characteristics.

¹ https://www.ffg.at/sites/default/files/downloads/page/brochuere_benefit_aal_e.pdf

4.6 Health-related research in Pillar 1

4.6.1 European Research Council – ERC

Table 8: Key Figures – Health-related ERC Grants

	Austria			Total			Share of Austria %
	Evaluated	Funded	Success rate %	Evaluated	Funded	Success rate %	
ERC Coordinated Grants	115	29	25,2%	6.073	734	15,8%	3,9%
ERC EC contribution (in Mio €)	221	61	27,6%	10.774	1.449	13,4%	4,2%

Source: eCORDA data as of 30/09/2017, diagram: FFG

4.6.1.1 How does the ERC work?

The ERC's mission is “to encourage the highest quality research in Europe through competitive funding and to support investigator-driven frontier research across all fields of research, on the basis of scientific excellence”. The most important principles are: one researcher - one host institution - one project - **one selection criterion: scientific excellence**. Applications can be made in any field of research, by independent researchers from anywhere in the world, of any age and career stage but research must be carried out in one of the 28 EU member states or in associated countries.

Types of grants:

- **ERC Starting Grant** (young, early-career top researchers), up to 1,5 Mio €
- **ERC Consolidator Grant** (already independent excellent researchers 7-12 years after PhD), up to 2 Mio €
- **ERC Advanced Grant** (senior research leaders), up to 2,5 Mio €
- **ERC Proof of Concept Grants** for ERC grant holders who want to check the market and/or innovation potential of research results from ERC-projects, up to 150.000 €

The evaluation of ERC Starting, Consolidator and Advanced grants is organised along three research domains, and in total 25 panels. The 9 panels under the research domain “Life Sciences” cover everything from molecular biology, genetics, developmental biology, physiology, neurosciences, immunity, diagnostics, applied life sciences, and many more. For this dossier, **the first 7 of these Life science panels were analysed as a whole**, and not broken down into a more detailed analysis. Two panels with Life Science, which cover for example environmental biology or non-medical biotechnology, were excluded in order to be as accurate about health-related projects as possible. CSAs and Proof of Concept Grants were also excluded from the analysis, because they are not assigned to thematic panels during the evaluation.

4.6.1.2 Austria’s performance in ERC – Health-related research

In the area of health-related research, until now **29 Austrian participations were successful, and attracted 61 Mio € of funding**. More than half of this funding originates from successful ERC Advanced Grants, whereas Starting Grants and Consolidator Grants make up around 25% each. Set in the overall Austrian context, **health-related ERC research accounts for around 40% of the Austrian ERC funding, so represents a very important sector**. In the European context, the Austrian performance in health-related research is **very successful** and high above average compared to other programmes (share of 4,2% of all funding).

When studying in more detail the successful Austrian organisations, this confirms the trend mentioned above that some organisations, who were still active in collaborative research in FP6 and FP7, **have now almost completely shifted their funding focus on the ERC**, such as the Institute of Sciences and Technology Austria/ISTA, the Research Institute of Molecular Pathology/IMP, the Institute of Molecular Biotechnology (IMBA) or the Research Center for Molecular Medicine (CeMM). In addition, universities are also more and more succeeding, such as (amongst others) University of Vienna, Medical University of Vienna and Technical University of Vienna, confirming again that one has to diversify efforts in order to be successful in Horizon 2020.

In summary, the ERC plays a highly relevant role in the overall funding structure of health-related research, and is used by many players for funding their basic research related to Health. For clinical research, it can be more challenging to be funded through the ERC, but there are first successes.

4.6.2 Marie Skłodowska-Curie actions (MSCA)

Table 9: Key Figures – Health-related MSCA Grants

	Austria			Total			Share of Austria %
	Evaluated	Funded	Success rate %	Evaluated	Funded	Success rate %	
MSCA Participations	577	60	10,4%	22.062	2.507	11,3%	2,4%
MSCA EC contribution (in Mio €)	177	13,9	7,8%	6.541	629	9,6%	2,2%

Source: eCORDA data as of 30/09/2017, diagram: FFG

4.6.2.1 Funding schemes in MSCA

The Marie Skłodowska-Curie actions (MSCA) provide grants for all stages of researchers' careers (from doctoral candidates to experienced researchers) and encourage transnational, intersectoral and interdisciplinary mobility. MSCA are fully “bottom-up” and open to all domains of research and innovation, from fundamental research to market take-up and innovation services.

Types of grants:

- **Research networks (ITN):** support for Innovative Training Networks => joint research training and/or doctoral programmes, implemented by European partnerships of universities, research institutions, and non-academic organisations.
- **Individual fellowships (IF):** support for experienced researchers undertaking mobility within and beyond Europe, optionally to the non-academic sector. The grant usually covers two years' salary, a mobility allowance, research costs and overheads for the host institution.
- **International and inter-sectoral cooperation through the Research and Innovation Staff Exchanges (RISE):** support for short-term mobility of research and innovation staff at all career levels, including also administrative and technical staff

COFUND programmes (to co-fund regional, national and international programmes that finance fellowships) and the European Researchers' Night (NIGHT) are NOT part of this dossier.

Due to the bottom up nature, similar to the ERC, proposals are allocated to one of 8 research areas, one of them being Life Sciences, where all subdivisions cover health-related research, and were thus included in this analysis.

4.6.2.2 Austria's performance in MSCA – Health-related research

In the area of health-related research, until now, **60 Austrian participations were successful, and attracted funding of 14 Mio €**. A big chunk (9,5 Mio €) of this funding comes from ITNs with 28 participations, including 2 Austrian coordinators. So far, 23 Individual Fellowships were successfully hosted by Austrian organisations (3,9 Mio € funding), and 9 RISE participations (0,6 Mio €). The big discrepancies in the allocated budgets originate in the different funding schemes and what type of costs count as eligible costs in each type of grant (for example much higher trainings costs in the ITNs, and no funding of personnel costs in RISE, and so on...).

MSCA also face **very competitive success rates** for some instruments, for example on average 8% for the ITNs, whereas IF have higher success rates of 15%, and RISE exceptionally high ones with 32%.

Set in the overall Austrian context, the health-related projects analysed above account for 20% of the Austrian MSCA funding and 24% of participations – less than for the ERC, but still representing an important sector.

In summary, MSCA are an attractive alternative for organisations acting in the Health research sector, especially for funding mobility of younger researchers through doctoral training programmes, or Post-Doctoral fellowships.

4.6.3 Research Infrastructures

4.6.3.1 Funding through Horizon 2020

Based on the overall objectives of the Horizon 2020 programme “European Research Infrastructures” (RIs), **three major types of activities** are funded, plus support measures:

1. Development of new world-class research infrastructures => support for preparatory phase of new ESFRI (European Strategy Forum on Research Infrastructures) projects, and the implementation and the operation phases of prioritised ESFRI projects as well as structuring actions (“Cluster projects”) for those.
2. Optimising the use of the national facilities by integrating them into networks and opening their doors to all European researchers (Integrating Activities)
3. Development and further deployment of ICT based e-infrastructures

ESFRI identifies RIs of pan-European interest across all scientific areas, with many of them relevant for the Health sector. Some have already been implemented through a so-called “European Research Infrastructures Consortium (ERIC)”, a newly established community legal framework based on Article 171 of the EC Treaty.

4.6.3.2 Health-related performance in Austria

So far, overall in the RI programme, 5 projects are coordinated by Austria, and 13,6 Mio € of funding has been attracted. **Health-related activities play a major role here:** a large chunk of 5,3 Mio € (almost 40%!) can be attributed to either Health-related projects (4,4 Mio €), or health-related organisations participating in cross-cutting projects (0,9 Mio €), and there are 14 health-related successful participations, including two coordinators.

The central player within Austria is BBMRI (Biobanking and BioMolecular resources Research Infrastructure): Austria is the hosting country of the BBMRI-ERIC headquarter, and with this legal entity also highly active and visible in Horizon 2020. BBMRI-ERIC is the coordinator of 2 projects, and in addition participates in 7 other projects, ranging from cross-cutting issues (such as training programmes, activities within the context of the European Open Science Cloud...) as well as health-specific implementation issues of biobanking and contribution of the biobank to, for example, cancer-related projects.

In addition to BBMRI-ERIC, **other organisations such as the Medical Universities have also successfully participated in projects** on mouse resources, infrastructures for pathogenic agents and a paediatric clinical research infrastructure network.

In summary, health-related activities play a major role in Austria's overall performance in the RI programme, and the central player in funded Horizon 2020 projects is BBMRI-ERIC.

4.6.4 Future and Emerging Technologies (FET)

4.6.4.1 Funding schemes within FET

The vision of the FET programme is to turn Europe's excellent science base into a competitive advantage, by initiating radically new lines of technology through unexplored collaborations between multidisciplinary science and cutting-edge engineering.

The FET programme has three complementary lines of action:

1. FET Open: bottom up, funds projects on new ideas for radically new future technologies, at an early stage when there are few researchers working on a project topic.
2. FET Proactive: projects on emerging themes, seeking to establish a critical mass of European researchers in a number of promising exploratory research topics.
3. FET Flagships are 1-billion, 10-years initiatives where hundreds of excellent European researchers unite forces to focus on solving an ambitious scientific and technological challenge, like understanding the Human Brain or developing the new materials of the future, such as Graphene.

Unlike ERC and MSCA, FET projects are not evaluated in subgroups according to scientific disciplines, making a Health-specific analysis very cumbersome. Thus, we have only screened the 52 successful participations for a health-related relevance, and not the 600 unsuccessful ones.

4.6.4.2 Health-related success in FET for Austria

So far, in FET, 24 Mio € of funding has been given to 52 Austrian organisations and 7 projects are coordinated by Austria.

Of these 24 Mio €, **about 6,2 Mio € are Health-related projects by 9 organisations**. This substantial share of 25% is based on Austria's participation in the FET Flagship **"Human Brain Project"**, where 3 Austrian organisations are successfully participating. Most other health-related projects are in the area of emerging imaging, diagnostic and pharmaceutical trends.

FET research projects are highly competitive – the overall success rate for Research and Innovation Actions is only 4,3%, and Austria is slightly above average with 5,5%. Still this means that many excellent proposals above threshold could not be funded in the end.

Nevertheless, we know from applicants that FET projects are an interesting alternative for project ideas that fall out of scope from the SC1 calls, and that many organisations have started to explore FET funding.

4.7 National Funding – FWF and FFG, and relation to Horizon 2020

4.7.1 Funding programs and statistics

The **two big national funding bodies** relevant for Life Sciences and therefore health-related research are the FWF (Austrian Science Fund) and the FFG (Austrian Research Promotion Agency). In addition, there are several other regional funding bodies, and institutional funding schemes (such as the Ludwig Boltzmann Institutes), which include a lot of health-relevant research, but in the context of Horizon we will focus on the FWF and FFG, since both are also participating in

transnational funding schemes such as ERA-NETs. **Taken together, at least 100 Mio €, mostly more, are funded per year by these two organisations in the area of biology and medicine.**

The **FWF is Austria's central funding organisation for basic research.** This is implemented through several programmes, ranging from single project funding, to larger Special Research Programmes, to Doctoral programmes and mobility funds and also participation in several ERA-NETs. Interesting for Health research is a dedicated program to fund projects in the field of non-commercial clinical research (KLIF). **Overall, the FWF spends on average 40% of their annual budget on projects in the field of biology and medicine. In the special programme “KLIF”, from 2014 to 2016, 24 projects have been funded with a volume of 6,4 Mio €.**

FFG is the national funding agency for industrial research and development in Austria. For the funding statistics of FFG, the term ‘life sciences’ covers a broad range of subjects – from medicine, chemistry, pharmaceuticals and manufacturing technology to agriculture and nutrition science. Each year, in average around **10% of the total FFG funding is spent on Life Sciences, and around 5-7% on health-related projects only** (between 35 and 40 Mio € each year). Most of this funding for Life Sciences projects is based on individual projects funded under the FFG’s General Programmes. Life sciences also play a major role in the FFG’s “Structural Programmes”, for example under the COMET Programme (Competence Centers for Excellent Technologies). However, in contrast to other disciplines such as energy, ICT, production and mobility, **there is no dedicated national FFG funding programme anymore for Life Sciences.**

Both FWF and FFG are also funding partners in **transnational public-public partnerships**, such as ERA-NET Cofunds and Eurostars. For Eurostars, on average 1,5 Mio € was invested by FFG over the last years, and concerning health-related ERA-NETs, FFG is partner in Eurotransbio, and funds between 2-4 project participations per year. The FWF is partner in several health-related ERA-NETs (E-Rare, Neuron, TransCan, Infect-ERA, ERA CoSysMed, ERA-CVD), and funds several project participations per year.

Table 10: National Funding by FWF and FFG for health-related research

Area	2014 in €	% of Total	2015 in €	% of Total	2016 in €	% of Total	2017 in €	% of Total
FWF Biology & Medicine	82,2 Mio	40,4%	70,5 Mio	35,4 %	69,7 Mio	37,9%	Not published yet	
FWF only KLIF	1,2 Mio	-	1,2 Mio	-	4 Mio	-	Not published yet	
FFG Health-related	59,8 Mio	9,5 %	35,8 Mio	7,5 %	42,0 Mio	6,7 %	35,4 Mio	5,1%

Sources: FFG: internal data. FWF: https://www.fwf.ac.at/fileadmin/files/Dokumente/Ueber_den_FWF/Publikationen/FWF-Jahresberichte/fwf-jahresbericht-2016.pdf

4.7.2 Relation of national funding to Horizon 2020 performance

Concerning the role of national funding in the Horizon 2020 performance, we had feedback from the Austrian community that **strong national funding programmes are missing in the Health area**, both in the medical field, as well as in the eHealth field, and that this could be a possible reason for a weaker performance in Horizon 2020, especially in terms of coordination of projects. From 2001 to 2013 (when the last projects ended), the Austrian Ministry of Science funded genomic research through the programme “GEN-AU”. This programme laid an important fundamental basis for genomic research in Austria, and probably contributed to some Austrian successes in FP6 and FP7. Funding of Genomic research was geared towards the priorities of Life Sciences/Genomics in FP6 and of Health in FP7, but, as explained above, not so much anymore towards the goals of Horizon 2020.

Many other Horizon 2020 areas have matching national programmes with strong national financial commitments over the last years, such as Energy, Information and Communication Technologies (ICT), Production, Transport, Security and others. These programmes might on a short-term basis slow down the “capacities” to at the same time also apply for European funding, but in a long-term perspective they most likely strengthen Austrian participations in Horizon 2020 by developing thematic leadership in certain areas, and setting the ground for project coordination also at European level at a later stage.

As explained above, there is currently no strong national funding programme for medical or life sciences research. The FWF does fund life sciences research through their range of programmes, and academic clinical research through KLIF, and the FFG through various instruments for applied research, but **most national funds for life sciences and medical research go into institutional funding**² for universities, or the Austrian Academy of Sciences institutes, or the ISTA, and others. **This results in excellent basic life sciences research institutes with high international reputation and a strong leadership**, but concerning Horizon 2020, these institutes are mainly clients of the ERC, and not of SC1. There is certainly also **acknowledged and excellently connected medical expertise and clinical research in Austria**, but not as widespread as for the more basic research institutes, and with different framework conditions in terms of working and research conditions as well as service support. As explained above in chapter 4.4., there are also very few big pharmaceutical players with research departments located in Austria, which might contribute to less successes in programmes such as IMI2.

4.8 COST Actions

Since its creation in 1971, COST (European Cooperation in Science and Technology) funds **pan-European, bottom-up networks** of scientists and researchers across all science and technology fields, thereby complementing the activities of Horizon 2020, and playing an important role in building a European Research Area (ERA). COST does not fund research itself but provides support for networking activities carried out within COST Actions, which have a four-year duration and a minimum participation of seven COST Member States. Researchers can also apply to join an existing COST Action. COST Actions are grouped along several scientific areas; relevant for this dossier is the area of “Medical and Health Sciences” (from 2016), or for earlier COST Actions “Biomedicine and Molecular Biosciences”.

20% of all running COST Actions are from these health-related areas, namely 53 out of in total 251 actions. Of these 53, **Austrian organisations are participating in 37 actions**, and one action is coordinated by Austria. This means on the other hand that in 16 actions Austrian organisations are not yet participating, so there is still potential for a stronger involvement. FFG is continuously trying to recruit Austrian researchers to join existing COST actions.

COST actions are an important tool for networking, and through this networking they also support consortia building for Horizon 2020 projects. Therefore, they can sometimes be regarded as “preparatory actions” for Horizon 2020 applications during or after the COST actions ends.

² https://www.bmdw.gv.at/Presse/Documents/Life_Science_Strategie_barrierefrei.pdf

5 Outlook

5.1.1 SC1 Calls 2018 – 2020

Previous calls mainly consisted of translational and clinical research calls, and calls for development of ICT for Health (e.g. mHealth applications) and ICT for Ageing solutions. **The new calls 2018-2020 are continuing this strategy** and have three overarching titles “Better Health and Care, economic growth and sustainable health systems (BHC)”, “Digital transformation in health and Care” and “Trusted Digital solutions and Cybersecurity in Health and Care”. Some topics in the BHC call are open to early stage research and development of novel technologies, but the big focus remains on application and efficient use of existing resources and data-driven systems approaches for analysis of information. Many topics under the “Digital Transformation in Health and Care” are designed to support pilot experiments to test the implementation of digital solutions on a large scale, which is in line with several of the EC’s priorities, for example a connected Single Digital Market.

Due to the nature of these upcoming calls, a similar participation pattern and results are expected for Austria.

5.1.2 FP9

The next “9th European framework Programme/FP9” will officially kick off in 2021, but preparations are currently ongoing and the first official ideas by the EC are expected to be presented around June 2018. From preliminary discussions it can be expected that there will on the one hand be a certain continuation of Horizon 2020, and a wider implementation of the European Innovation Council, but on the other hand a continuation of the strong focus on **“mission orientation” and impact. In any case, Health research will continue to be a major focus area.**

6 Recommendations for Action

The analysis of the status quo and the interpretation of available data lead to the following recommendations for action for the strategic planning of the European and national research funding programmes concerning Health research:

- **Efforts will be continued for the successful mobilisation** of Austrian organisations interested in Health, and to support especially 1st time-applicants by screening their projects ideas, and by providing success stories of funded Horizon 2020 projects. This will be helpful in particular for the more open, less prescriptive SC1 topics, in order to make Horizon 2020 Health projects less abstract for newcomers, and to stimulate new project ideas.
- Especially in the field of **Personalized Medicine, a stronger networking of Austrian and European organisations** is also the aim of the new “Austrian Platform for Personalized Medicine” (ÖPPM). FFG is collaborating with ÖPPM, for example to raise awareness for Horizon 2020 calls, and to provide the best possible support for Horizon 2020 proposals.
- One major finding is the reduced number of successful Austrian coordinators, as well as decreasing numbers of coordinators over the first four years, for which we suggested several potential reasons. Many of these possible reasons are beyond our influence as NCPs and are structural problems within the organisations, or rooted in national specifics. Nevertheless, we see the following fields for recommendations:
 - Winning SC1 proposals usually have 14,5 to 15 points, therefore only the highest-ranking proposals win, and many excellent proposals above threshold are not funded. Within FFG’s services, **we will try to further strengthen the quality of proposals**, for example by providing ”Lessons Learned from the evaluation

reports/Do's and Don'ts", and success stories of winning proposals. In SC1, FFG is in contact with the majority of coordinators (60-70% contact) and therefore has a good leverage to provide advice, offer proposal checks and maybe add the missing 0,5 to 1 points for success during the evaluation.

- Proposal writing has “professionalised” over the years – simply a good idea is not enough anymore. Substantial internal organisational support, and time, is needed to take up the role of a coordinator, and write a “winner proposal”. In order to play in this champions league, organisations should provide any form of support for coordinators, for example personnel resources for writing and project management, administrative support, grant writing offices, or financial help (for example to pay consultants) or other incentives. **With universities, we have raised, and will continue to raise these issues of internal support and incentives in our “ERA-Dialogues” meetings.**
 - At the same time, NCPs must also be honest about success rates, and sometimes **discourage project ideas** where they see only very little potential.
 - **Efforts for a new national funding programme**, for example in Personalised Medicine, or “Medicines of the Future” should be continued. Strong national funding increases both thematic leadership in Austria, as well as sets the ground for strong performance and coordination activities at European levels.
- On European level, the very low success rates and high competitiveness in SC1 show a great potential for excellent high-quality research, which can in the end not all be funded. The low number of approved applications is difficult to justify economically. **A higher budget in the core programme of Health in the next framework programme is therefore needed** and a lesser part could be allocated to PPP initiatives.
 - For companies that received the **“Seal of Excellence” in the SME instrument**, some adequate national financing opportunities might help to support these outstanding SMEs. Their excellent concepts were proven by international evaluations, justifying such support measures and considering that funding by the EC was not possible only because of limited budget.
 - **Experiences from first results out of the new bottom-up EIC scheme** will be considered in bilateral consultations with SMEs, in on-site trainings, webinars and in our advice materials.
 - Many Austrian organisations are still hesitant to participate in IMI proposal submissions, and in addition only rarely manage to get into the winning consortia. **Contacts to pharma industry of Austrian universities and other organisations, as well as general awareness and trust should therefore be strengthened.** Concerning universities, this is continuously highlighted in our “ERA-Dialogues” meetings.
 - The landscape of European Health research funding (Horizon 2020, public-private as well as public-public partnerships, EIT, DG Santé “Health Programme” etc.) should be carefully analysed both at national and European level in order to reduce the complexity and “funding jungle”, and make it easier for applicants to find the right instrument, and to understand the characteristics and differences. In addition, in many other European countries, the services for the two EC programmes of Horizon 2020 and the “Health Programme” of DG Santé are under one roof, and SC1 NCPs also advise on the DG Santé Programme. This scenario could also be analysed for Austria.
 - Austria is not participating in the **EIT Health. We are continuously observing the developments and new possibilities for participation**, e.g. the potential future opening of EIT Health for new partners (as an example, currently there is a “Wild Card” option for newcomers). All information is forwarded to the target group.

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