SENET-HUB
SINO-EUROPEAN HEALTH NETWORKING HUB

Strategy paper:
Towards closer EU-China health research and innovation collaboration

(Version 1.0, 30/09/2019)

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Content

List of Figures

List of Tables

Abbreviations and Acronyms

Abbreviation, Acronym	Description
$	Dollar (United-States of Americas)
€	Euro (European money)
AI	Artificial Intelligence
AIDS	Acquired Immune Deficiency Syndrome
BUCM	Beijing University of Chinese Medicine (project partner)
CFM	Co-Funding Mechanism
CNCBD	China National Center for Biotechnology Development (project partner)
CNHDRC, PRC	China National Health Development Research Center (project partner)
CRG	Centre for Genomic Regulation (project partner)
CSA	Coordination and Support Action
CSTEC	China Science and Technology Exchange Center
CVD	Cardiovascular Disease
EC	European Commission
ECCP	European Cluster Collaboration Platform
EEN	Enterprise Europe Network
e.g.	*exempli gratia*
ERC	European Research Council
ESC/ESH	European Society of Cardiology (ESC) / European Society of Hypertension (ESH)
EU	Europe
EU/EEA	European Union / European Economic Area
EU MS	Member States of the European Union
EVI	European Vaccine Initiative (project partner)
FP7	EU's Seventh Framework Programme for Research
GDPR	General Data Protection Regulations
HBV	Hepatitis B Virus
HIV	Human Immunodeficiency Virus
H2020	Horizon 2020
i.e.	*id est*
ICT	Information and Communication Technology

inno	inno TSD (project partner)
MCSA	Marie Sklodowska-Curie actions
MOST	The Ministry of Science and Technology of the People's Republic of China
NCP	National Contact Point
NSFC	National Natural Science Foundation of China
Ph.D.	Philosophiæ doctor
R&D	Research and Development
R&I	Research and Innovation
RMB	Renminbi (Chinese currency)
SARS	Severe Acute Respiratory Syndrome
S&T Linkedin	Science and Technology Linkedin (project partner)
SENET	Sino-European Health Networking Hub
SPI	Sociedade Portuguesa de Inovacao (project partner)
S2i	Steinbeis 2i GmbH (project coordinator)
TCM	Traditional Chinese Medicine
UK	United-Kingdom
UNESCO	United Nations Educational, Scientific and Cultural Organization
USA	United State of America
USD	United State Dollar
WHO	World Health Organisation

Executive Summary

The Horizon 2020 (H2020) funded project SENET (Sino-European Health Networking Hub) aims to create a sustainable dialogue between health research and innovation (R&I) actors from the European Union (EU) and China, and to facilitate the participation of Chinese researchers in H2020.

Firstly, SENET focuses on assessing the current status of European and Chinese health R&I priorities. This will be done by highlighting common challenges and collaboration, identifying obstacles, good practices and motivations for researcher mobility as well as by an overview of funding scheme agreements.

Secondly, throughout the project, SENET will engage health R&I experts who contribute to the development of strategic recommendations and the design of a roadmap for enhancing collaboration between the EU and China. They will support SENET by defining common priorities, providing recommendations on new programmes and funding schemes and by further investigating how to tackle barriers to researcher mobility. Based on the information given, SENET will develop a consolidated action plan for health R&I priorities.

Finally, SENET will offer opportunities to forge cooperation and encourage collaborative R&I efforts through Virtual Ideation Hackathons, help identify partners for calls (Call Power Partnering) and find suitable funding sources for projects. Furthermore, the European and Chinese funding schemes will be promoted through Roadshows co-organised by SENET and partners such as the Enterprise Europe Network (EEN) and the National Contacts Points (NCPs).

Overall, SENET will facilitate favourable conditions to increase a sustainable dialogue between the EU and China and future cooperation in health R&I.

In this context, one of the objectives of this paper "Strategy paper: Towards closer EU-China health research and innovation collaboration" is to describe and identify the health R&I priorities in the EU and China (section 3). This identification has been supported by an online survey as well as interviews with health experts.

The three main priorities previously identified by the SENET partners in the report "Review on health research and innovation priorities in Europe" (i.e. infectious diseases, chronic diseases and rare diseases), have been confirmed in this paper.

The report also aims to assess the current situation of EU-China health R&I collaborative projects, the participation of Chinese health R&I stakeholders in H2020, the participation of European health R&I stakeholders in Chinese funded programmes, as well as obstacles and barriers to collaboration (section 4).

Furthermore, this paper offers an analysis of the current situation, as well as the drivers and barriers of the mobility of European and Chinese health researchers. It also provides an overview of good practices in mobility and the support expected by researchers applying to mobility programmes (section 5). Mobility programmes are a great tool to improve collaboration.

Finally, recommendations are provided on how to increase collaboration between the EU and China through common health R&I priorities, programmes and funding frameworks and the improvement of researcher mobility (section 6).

The terms and provisions of the EU Grant Agreement (and its annexes) and the SENET Consortium Agreement will prevail in the event of any inconsistencies with recommendations and guidelines defined in this report.

1 Introduction

Since the well-established EU-China Science and Technology Cooperation Agreement (in place since 1998 and renewed for another 5-year period in April 2019) formed the foundation for research cooperation between China and the EU, both regions are determined to intensify their collaboration through joint initiatives. The SENET project is built upon this and aims to further improve cooperation between the EU and China. The last EU-China Summit was held in July 2018 in Beijing and it reaffirmed both regions' desire to further develop strategic partnerships.

Three public reports have already been prepared under SENET based on desk research and comparative analysis. The first report "Scoping paper: Review on health research and innovation priorities in Europe and China" focuses on bilateral agreements, health priorities and action plans in R&I. The second report "Map of the major funding agencies and stakeholders in Europe and China" aims to identify relevant funding agencies, health related funding schemes and programmes and initiatives. Finally, the third public report "Guide for health researchers from Europe and China through the funding landscape" provides guidelines for the application to health funded programmes and informs about the latest developments of R&I in the EU and in China.

For this strategy paper, information has been gathered via desk research, interviews and a survey in order to validate the previous findings, to analyse the state of collaboration in the health R&I landscape, to analyse the current situation of researcher mobility, and to identify existing obstacles to collaboration. This paper also highlights opportunities to improve collaboration and mobility and gives some recommendations on how to address reciprocity issues.

2 Methodological approach: data collection and analysis

2.1 Survey

The SENET project team has developed an online survey (attached in annex 8.1) addressing health R&I actors (NCPs, helpdesk, researchers). It was designed according to their profiles (NCPs and researchers were distinguished). Some questions were targeted at Chinese or European interviewees specifically.

The survey had to be short enough to allow a maximum number of people to respond, but also detailed enough to give the SENET partners in-depth information on the issues being studied. It aimed at supplementing the desk research with more qualitative information.

The survey was designed using "Limesurvey" and was reviewed by all partners to ensure the software was properly programmed and all questions could be answered.

Each partner was responsible for sending the survey to their own network. According to the project's Key Performance Indicators, 1,500 people had to be reached. The dissemination of the survey was monitored by the responsible partner SPI.

The survey was disseminated through targeted emails and social networks starting in July 2019 (Facebook, Twitter, and specific LinkedIn groups – e.g. H2020 Health LinkedIn, Health Sector LinkedIn, EEN H2020 Research LinkedIn etc.). The European Cluster Collaboration Platform (ECCP) has also been used for dissemination, through a newsletter published on 4 July 2019.

SENET Project Survey

This project has received funding by the European Union's Horizon 2020 research and innovation programme (Grant Agreement No 825904)

Thank you for your interest in taking our SENET Project Survey

The Sino-European Health Networking Hub – SENET – was launched in January 2019 and aims at creating a sustainable health networking and knowledge hub between Europe and China. Cooperation efforts focused on common health challenges will facilitate favourable conditions for a continuous and sustainable dialogue between China and the EU.

Within this context, this survey aims to assess:

- the health research and innovation priorities in the EU and China;
- the mobility of European and Chinese health researchers;
- current EU-China health research and innovation collaborative projects;
- the participation of Chinese health researchers and innovation stakeholders in Horizon 2020 and European health researchers and innovation stakeholders in Chinese funding programmes.

The opinions gathered will help us to develop a strategy paper that supports closer EU-China health research and innovation collaboration.

This survey is **anonymous** and will take will take about **10 minutes** to complete.

Please subscribe to our SENET newsletter to stay tuned about our activities!
For any enquiries, please see http://senet-hub.eu or contact SENETHub@steinbeis-europa.de.

Next

Figure 1: The SENET survey introduction

Take our survey and help us to intensify the cooperation between EU and China !

Are you an expert in **health Research**? Do you have experience in **collaborating with China**?

If YES, participate in the SENET project!

The Sino-European Health Networking Hub – SENET – was launched in January 2019. It aims at creating a sustainable health networking and knowledge hub between Europe and China and intensify the cooperation for the human health.

Our first goal is to assess current EU-China collaborations in healthcare R&I and develop a strategy paper that supports these collaborations. Help us in completing our **survey** or **contact us** to answer an interview on the following topics:

- the health research and innovation priorities in the EU and China;
- the mobility of European and Chinese health researchers;
- current EU-China health research and innovation collaborative projects;
- the participation of Chinese health researchers and innovation stakeholders in Horizon 2020 and European health researchers and innovation stakeholders in Chinese funding programmes.

We are looking forward to collaborate with you!

Figure 2: Website news informing about the survey and interviews

Figure 3: Tweet informing about the survey and interviews

- ECCP network[1] :
  - Number of registered users (cluster organisation, cluster policy experts, R&I): 4,319;
  - Weekly digest subscribers: 3,776;
  - Open rate of the weekly digest (July data): 22.5%;
- EEN Network: 50 Sector Group members of the EEN;
- LinkedIn:
  - EEN H2020 research members on LinkedIn: 343;
  - MyBio[2] LinkedIn members: 59,429;
  - H2020 health group LinkedIn members: 5,157;
  - Health sector group stakeholders LinkedIn members: 823;
- SENET Twitter:
  - 4,366 impressions (total number of tweet views);
  - 13 link clicks;
  - 18 retweets;
- Contacts and participants were asked to disseminate the survey within their own networks;
- Multiple reminders were sent through LinkedIn and Twitter.

As described in the online survey introduction, it was drawn up to assess:

- The health R&I priorities in the EU and China;
- The mobility of European and Chinese health researchers;
- Current EU-China health R&I collaborative projects;
- The participation of Chinese health R&I stakeholders in H2020 programmes and European health R&I stakeholders in Chinese funding programmes.

[1] https://www.clustercollaboration.eu/news/participate-senet-survey-about-health-collaboration-china (accessed 30th July 2019)

[2] https://www.linkedin.com/company/mybio https://www.linkedin.com/company/mybio (accessed 30th July 2019)

The participants were asked if they were/are :

- An applicant to H2020 or Chinese or Co-funding mechanism programmes (researchers, SMEs/industries),
- A National contact point (NCP) / Enterprise Europe Network member (EEN) / programme "owner" (typically ministries or regional authorities defining research programmes) or programme "manager" (such as research councils or other research funding agencies managing research programmes)

2.1.1 Profiles of the survey participants

In total, twenty-four people replied to the survey. The infographics below represents the participants' profiles:

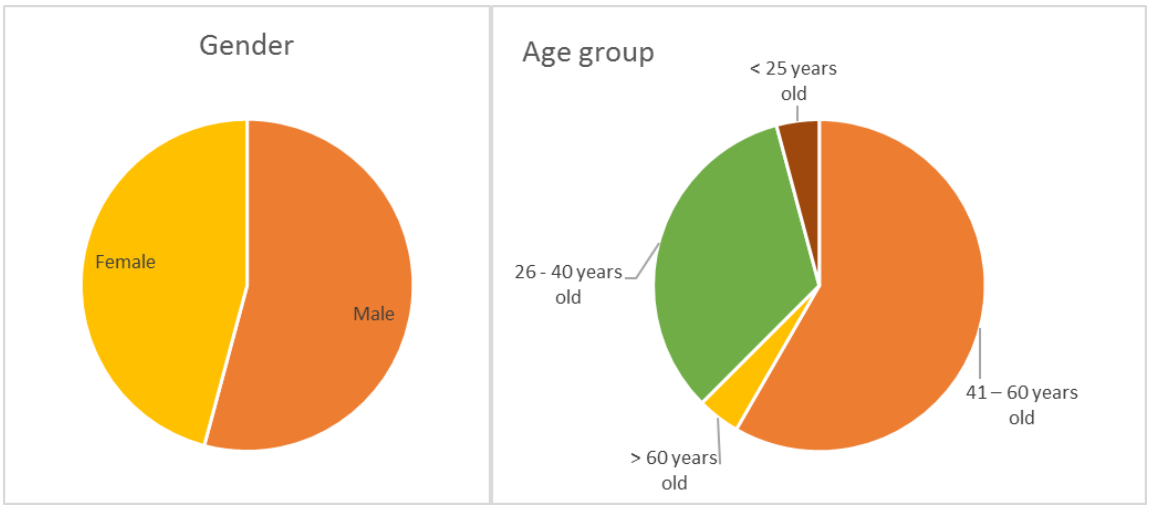


Figure 4: Gender and age distribution of survey participants

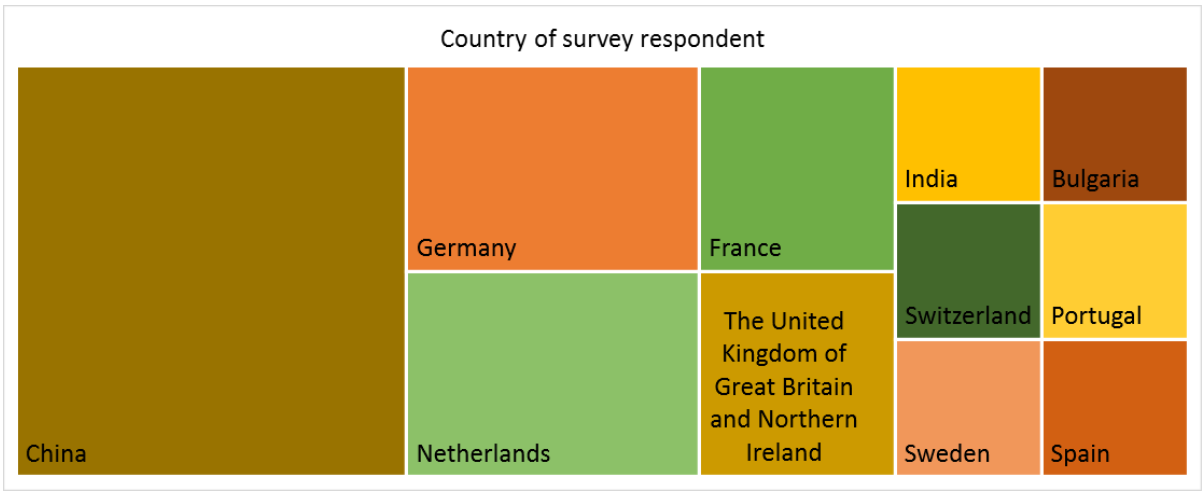


Figure 5: Survey participants' country of origin

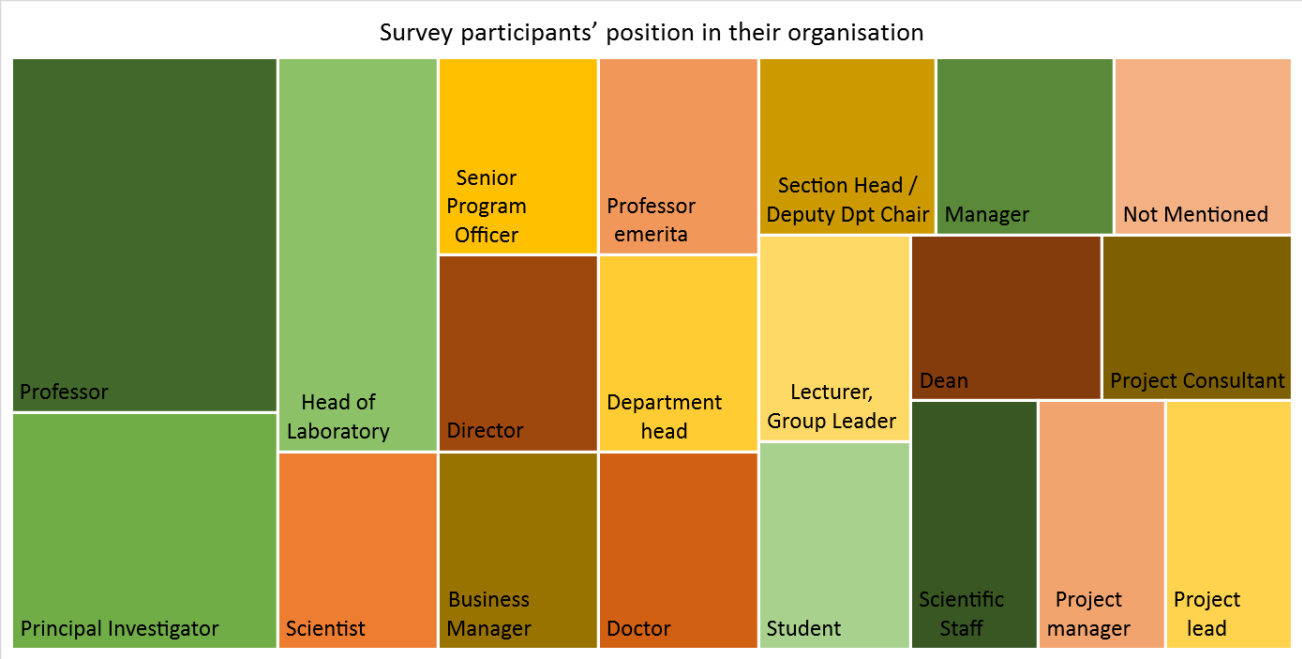


Figure 6: Survey participants' position in their organisation

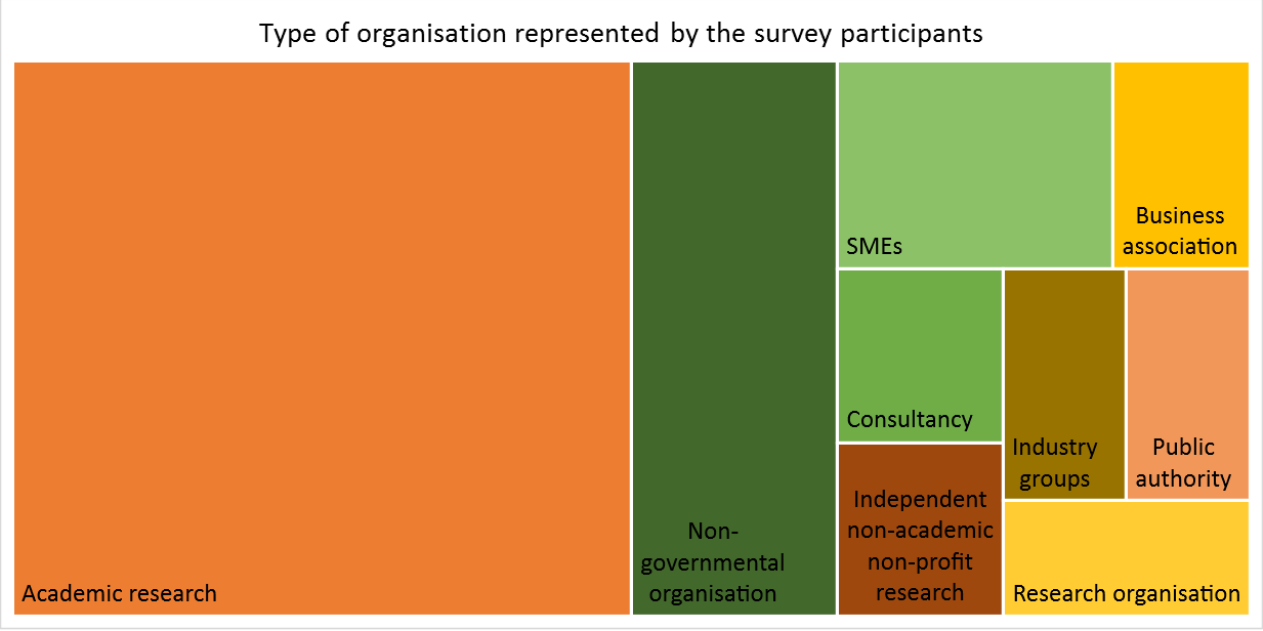


Figure 7: Type of organisation represented by the survey participants

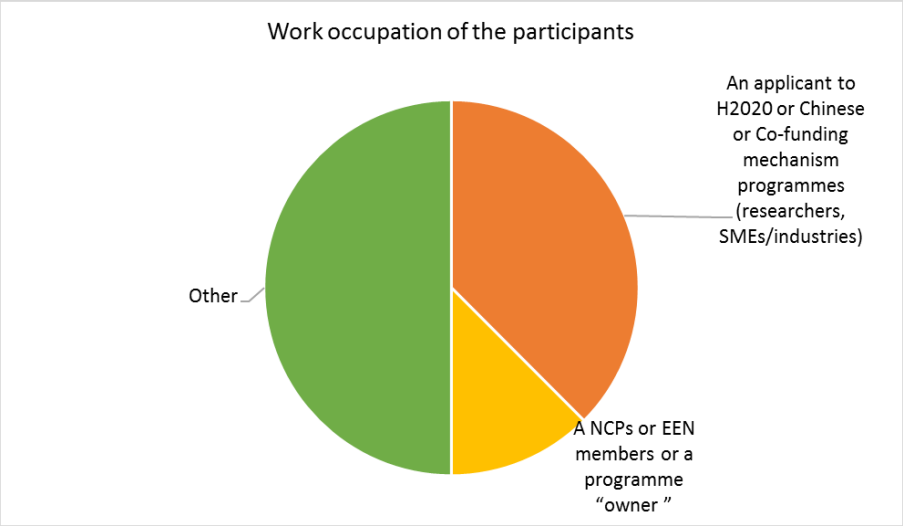


Figure 8: Work occupation of the survey participants

2.1.2 Survey participants' topics of interest

The R&I topics of interest of each participant were asked. The participants' responses were in line with the SENET priorities because they were the same as the common priorities between the EU and China (section 3.1). These were:

- Vaccines: vaccine development and safety, systems vaccinology, vaccination and immunotherapy; (8) [3]
- Chronic diseases: prevention, diagnosis and treatment, notably cancers, chronic pain and hypertension. (8)
- Infectious diseases: drug development for malaria, cellular and molecular virology, tuberculosis, HIV, Zika virus. (7)
- Genetics / Genomics / Gene sequencing (5)
- Personalised / Precision Medicine (4)
- Cellular / Molecular Biology / Systems Biology (3)
- Immunology (2)
- Epidemiology (2)
- Reproduction/gynaecology (2)

The following areas were cited once:

- Smart Health Wearables
- Artificial Intelligence (AI) in trans-Omics study
- Ageing and longevity research
- Demography
- Prevention and treatment of common diseases
- Nutrition
- Regulatory science
- Neglected diseases
- Healthcare
- Animal models
- Data storing and sharing among multi-sites study
- Remote Patient Care & Telehealth

[3] The number in brackets refers to the number of citations by the survey participants

- Diagnostic
- Surgery
- Medicine
- Tailor-made health services
- Chinese medicine

2.2 Interviews

The interviews were initially scheduled to be completed after the end of the survey. The qualitative data collected was aimed to identify the biggest health priorities and trends for future years, the main obstacles/opportunities for European and Chinese applicants to participate in H2020 projects or Chinese programmes, and ways for European and Chinese researchers to gain easier access to funding programmes.

Potential interviewees were identified through the partners' networks and each partner was assigned a number of interviews to conduct. Individual invitations explaining the aim of the study were sent to potential participants by the partners and the study was also promoted via different social media channels (i.e. website, Twitter, LinkedIn) (Figure 1 - Figure 2 - Figure 3).

Interview guidelines were given to the partners to ensure that the information collected was as homogenous as possible (the guidelines are attached in annex 8.2).

A process for sharing results and handling the data was put in place: An Information Sheet and an Informed Consent Form were sent to the participants before the interviews, according to the General Data Protection Rules (GDPR).

In total, twenty interviews were conducted.

2.3 Desk research

Desk research was conducted by all SENET partners in order to prepare the different reports preceding this strategy paper. In particular, partners identified funding agencies, mobility programmes and health R&I priorities in the EU, EU Member States (MS) and China.

3 Health R&I priorities

3.1 Priorities identified in the report "Scoping paper: Review on health R&I priorities in Europe and China"

In the first report (Scoping paper: Review on health R&I priorities in Europe and China), three main R&I priorities for collaboration between the EU and China were identified: infectious diseases, chronic diseases and rare diseases.

These priorities were found through desk research, notably through the analysis of European and Chinese health funding programmes.

Table 1: EU and China common health R&I priorities[4]

Infectious diseases	Chronical diseases	Rare diseases
HIV/AIDS, malaria, tuberculosis, avian influenza and viral hepatitis (hepatitis B) and outbreaks of global outreach e.g. Ebola	Cancer, cardiovascular and chronic respiratory diseases, hypertension diabetes and risk factors such as smoking and obesity	Molecular genetics, metabolic diseases, neurology, mental health and psychiatric diseases, immunology (SCID allergies, immune deficiency and other immune disorders), neuromuscular and musculoskeletal disorders, cardiovascular, haematological disorders, and dermatology

The survey and interviews conducted for this strategy paper have validated the health R&I priorities previously identified.

3.2 Analysis of the priorities and their relevance to SENET

Two types of priorities were found during the survey analysis and the interviews: **existing diseases** which have to be fought right now to ensure public health, and **societal trends** (that will lead to new diseases or Research and Development (R&D) solutions) researchers need to focus on and develop in the future.

3.2.1 EU-China health R&I priorities

To validate the previously found common health priorities, the survey participants were asked to name one to three priorities which they think should be health R&I priorities for European and Chinese researchers. As already mentioned, the most cited priorities were the following:

- **Infectious diseases (10)**[5]
- **Chronic diseases (9)**
- **Vaccines (5)**
- Genomics (2)
- Translational Medicine / research (2)
- Artificial intelligence in medicine (2)

The following priorities were cited once:

- Demography
- Artificial intelligence in medicine

[4] "Scoping paper: Review on health research and innovation priorities in Europe and China" SENET consortium paper August 2019, available on SENET WEBSITE https://www.senet-hub.eu/public-report/

[5] The number in brackets refers to the number of citations by the survey's participants

- Pricing and reimbursement of precision medicine
- Medicine
- Two-way cultural exchange
- Regulatory science
- Medical data sharing
- Drug development for poverty-related diseases
- Life Science
- Epidemiology
- Metabolic Disease
- Personalised Medicine
- Nutrition
- Integrated "One Health" prevention: collaborative, multisectoral, and transdisciplinary approach — working at the local, regional, national, and global levels[6]
- Remote Patient Care & Telehealth
- Artificial intelligence
- Reproductive and child health and surveillance

3.2.1.1 Infectious diseases

Infectious diseases are disorders caused by organisms (such as bacteria, viruses, fungi or parasites). They are also called "communicable diseases" and are one of the biggest health threats. As mentioned by the Institut Pasteur[7], the number of **new infectious diseases** has severely increased over the last fifty years (notably Severe Acute Respiratory Syndrome (SARS) and H7H9 influenza virus being recent examples in China), and known parasites (*plasmodium falciparum, plasmodium vivax* responsible for malaria*)*, bacterial and fungal pathogens[8] are re-emerging.

Viral diseases can be specific to some areas of the world (e.g. Zika, Ebola, Avian flu, SARS, Hepatitis B, malaria) but they are a danger for all countries as they are **easily transmissible** (by vectors such as mosquitos) and widely diffused through birds and **the increase of travelling**.

Indeed, travellers play an important role in the import/export of infectious diseases, as shown in a 2015 study on the carriage of Multidrug-Resistant Enterobacteriaceae. After Travel[9]. The study showed that 72% of travellers coming from China are positively exposed to the pathogens. In Europe, diseases like chikungunya, dengue (France and Italy), and malaria (Greece) are also increasing.

According to researchers, **temperature** plays an important role in the development of infectious diseases. For example, the vectors of Zika and malaria spread at 29 and 25 degrees Celsius respectively[10]. Temperature is also a driver for the development and lifespan of dengue and chikungunya[11].

Human activities that lead to global or local climate changes affect the geographical distribution of diseases[12].

[6] https://www.cdc.gov/onehealth/basics/index.html
[7] https://www.pasteur.fr/en/our-missions/strategic-plan-2019-2023/emerging-infectious-diseases (accessed 16th September 2019)
[8] https://www.ncbi.nlm.nih.gov/pubmed/31010605 and https://doi.org/10.1053/j.semdp.2019.04.010 (accessed 26 th September 2019)
[9] https://www.ncbi.nlm.nih.gov/pubmed/25904368 - Vignier N, Bouchaud O. Travel, Migration and Emerging Infectious Diseases. EJIFCC. 2018;29(3):175–179. Published 2018 Nov 7. (accessed 30th July 2019)
[10] https://earth.stanford.edu/news/how-does-climate-change-affect-disease#gs.3ji8mn (accessed 16th September 2019)
[11] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5423694/ - Mordecai EA, Cohen JM, Evans MV, et al. Detecting the impact of temperature on transmission of Zika, dengue, and chikungunya using mechanistic models. PLoS Negl Trop Dis. 2017;11(4):e0005568. Published 2017 Apr 27. doi:10.1371/journal.pntd.0005568 (accessed 16th September 2019)
[12] https://www.who.int/globalchange/climate/en/chapter6.pdf (accessed 16th September 2019)

Besides the rise of viral infection, **bacterial infections** are also increasing around the globe, closely linked to the development of antibiotic resistances. Addressing antibiotic resistance is of primary importance since it severely limits treatment options.

In fact, a growing number of infections are becoming harder to treat due to **antibiotic resistance.** This means that the bacteria have developed the ability to defeat the drugs designed to kill them, which makes the infections difficult and sometimes impossible to treat (potentially leading to future epidemic or pandemic).

As reported in a WHO 2018 factsheet, antimicrobial resistance can be detected worldwide. For example, 490,000 people developed multi-drug resistant tuberculosis globally in 2016[13].

In 2018, the rate of patients that were not responding to at least one of the most commonly used antibiotics, had increased from zero to 82%[14].

The development of antimicrobial resistance coincides with the large-scale use of antibiotics. In 2019, a bibliographic study identified the most common factors causing resistance. As mentioned in the paper, "in developing countries, key contributors identified included: lack of surveillance of resistance development, poor quality control of available antibiotics, clinical misuse, and ease of availability. In contrast, in developed countries, factors contributing to antibiotic resistance included: poor hospital-level regulation and overuse of antibiotics in food-producing animals".[15]

Prevention mechanisms are needed to decrease the prevalence of infectious diseases at a global level. Quick and effective controls, using **vaccines and hygienic measures** are notably important to limit the spread to other countries as well as development of innovative R&D solutions.

Fighting newly **emerging infectious diseases** is a great opportunity to develop partnerships. Working on these topics requires transparency and data sharing. Therefore, these topics need to be discussed between the EU and China.

Researchers should particularly focus in the following infectious diseases, as they are considered to be very critical. More health priorities were identified through survey and interviews. Their relevance in the EU and China were analysed in annex 7.

Priority	HIV
Relevance in Europe	**Why is it important?** In 2017, over 25,000 people were diagnosed with HIV in 30 out of the 31 European Union / European Economic Area (EU/EEA) countries. The rate of new HIV diagnoses continues to rise in about one third of EU/EEA countries[16]. Just over half of those diagnosed in the region are diagnosed at a late stage of infection[17]. **How is it supported?** The momentum to revamp political commitment to end Acquired Immune Deficiency Syndrome (AIDS) by 2030 has never been stronger in the European

[13] https://www.who.int/en/news-room/fact-sheets/detail/antimicrobial-resistance (accessed 16th September 2019)
[14] https://www.who.int/mediacentre/news/releases/2018/antibiotic-resistance-found/en/ (accessed 16th September 2019)
[15] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6380099/ Chokshi A, Sifri Z, Cennimo D, Horng H. Global Contributors to Antibiotic Resistance. J Glob Infect Dis. 2019;11(1):36–42. doi:10.4103/jgid.jgid_110_18 (accessed 16th September 2019)
[16] https://ecdc.europa.eu/en/news-events/new-hiv-diagnoses-alarmingly-high-levels-european-region-despite-progress-eueea (accessed 30th July 2019)
[17] http://www.euro.who.int/en/health-topics/communicable-diseases/hivaids (accessed 30th July 2019)

	Region. Country specific roadmaps are being developed to reinforce a common agenda among key policy makers, partners, funders and implementers[18].
Relevance in China	**Why is it important?** China accounts for 3% of new HIV infections globally each year. In 2018, a 14% rise in new infections was reported, with 40,000 in the second quarter alone. The lack of comprehensive sexual education is a major barrier to an effective response[19]. **How is it supported?** In 2017, China promoted comprehensive prevention programmes that targeted key population groups at greater risk of HIV. HIV prevention programmes have consistently been developed across the country in the last decade[20]. By the end of 2013, there were 13 major international AIDS response cooperative projects being implemented in China[21].

Priority	Hepatitis B
Relevance in Europe	**Why is it important?** In 2016, 30 EU/EEA MS reported 29,300 cases of hepatitis B virus (HBV), corresponding to a rate of 5.5 cases per 100,000 population[22]. **How is it supported?** Prevention and control programmes need further scaling up if European countries are to achieve the goal of eliminating hepatitis B.[23]
Relevance in China	**Why is it important?** There are more than 90 million chronic carriers of the HBV in China, accounting for about one-third of all HBV chronic carriers in the world[24]. Among the HBV-infected population in China, 28 million people require treatment, with 7 million of these being urgent due to high risk of developing cancer[25]. **How is it supported?** Thanks to China's large-scale hepatitis B immunisation program, chronic HBV among young children has decreased by 97%[25]. In 2015, the World Health Organisation (WHO) released its first-ever guidelines for the treatment of chronic hepatitis B in Chinese. The guidelines provide evidence-based recommendations on determining who requires treatment, which medicines to use, and how to monitor patients long term[26].

[18] https://www.unaids.org/sites/default/files/documents/CHN_narrative_report_2014.pdf (accessed 30th July 2019)
[19] https://www.avert.org/professionals/hiv-around-world/asia-pacific/china (accessed 30th July 2019)
[20] https://www.avert.org/professionals/hiv-around-world/asia-pacific/china#footnote46_mfgex20 (accessed 30th July 2019)
[21] https://www.unaids.org/sites/default/files/documents/CHN_narrative_report_2014.pdf (accessed 30th July 2019)
[22] https://ecdc.europa.eu/sites/portal/files/documents/AER_for_2016-hepatitis-B-rev1.PDF (accessed 30th July 2019)
[23] https://ecdc.europa.eu/sites/portal/files/documents/AER_for_2016-hepatitis-B-rev1.PDF (accessed 30th July 2019)
[24] http://www.wpro.who.int/china/mediacentre/factsheets/hepatitis/en/ (accessed 30th July 2019)
[25] http://www.wpro.who.int/china/mediacentre/releases/2016/20160727-china-world-hepatitis-day/en/ (accessed 30th July 2019)
[26] http://www.wpro.who.int/china/mediacentre/releases/2015/20150515/en/ (accessed 30th July 2019)

Priority	Malaria
Relevance in Europe	**Why is it important?** In 2017, 8,401 cases were reported in the EU/EEA, 8,393 of which were confirmed. Among 8,023 cases, 99.8% were travel-related. 21 confirmed cases were reported as acquired in the EU (seven in Greece and Italy, three in the United Kingdom, two in France and one each in Germany and Spain). As in previous years, the overall rate of confirmed malaria cases was higher among men than women (1.7 cases and 0.8 cases per 100,000 population respectively). **How is it supported?** The 2005 Tashkent Declaration "The move from malaria control to elimination", was a turning point in achieving a malaria-free Europe. The declaration led the way for the new Regional Strategy 2006-2015, which guided affected European countries to reduce the number of indigenous malaria cases to zero[27].
Relevance in China	**Why is it important?** Malaria is in the category B list of notifiable diseases to be reported according to the Law of Communicable Diseases Prevention and Control of China. In China, endemic malaria is caused by two types of parasites, namely *P. falciparum* and *P. vivax*. In 2011, 1,398 falciparum malaria cases were reported in 28 provinces, of which, 1,366 were imported from overseas. In 2011, the number of cases of imported falciparum malaria in non-endemic provinces increased by 49.13%, with 30 deaths – twice as many as in 2010[28]. **How is it supported?** In 2010, the Chinese government launched a national campaign on malaria elimination, with the goal of eliminating the disease throughout China by 2020. China has been working on a therapeutic efficacy study of antimalarial drugs in the Yunnan province since 2008 using artemisinin, supported by WHO[28].

3.2.1.2 Chronic diseases

According to the survey participants and interviewees, prevention and treatment of **cancer, chronic pain and hypertension** are the main priorities in the field of chronic diseases. Regarding cancer, the most cited ones are lung, breast, skin, gynaecological and rare cancers (e.g. uveal melanoma).

According the WHO, the proportion of the burden of non-communicable diseases is expected to increase up to 57% by 2020 and most of the deaths are attributable to cardiovascular diseases, obesity and diabetes[29].

Chronic respiratory diseases affect around 235 million people worldwide[30] not only as a result of smoking. It is also essential to explore the role of the environment in the rising number of disease related incidences (e.g. prevalence of asthma: 80% of asthma deaths occurs in low and lower-middle income countries annually). Research on the environment is a cross-cutting priority with this kind of diseases.

[27] http://www.euro.who.int/en/media-centre/sections/press-releases/2016/04/from-over-90-000-cases-to-zero-in-two-decades-the-european-region-is-malaria-free (accessed 30th July 2019)

[28] http://www.wpro.who.int/china/mediacentre/factsheets/malaria/en/ (accessed 30th July 2019)

[29] https://www.who.int/nutrition/topics/2_background/en/ (accessed 16 th September 2019)

[30] https://www.who.int/respiratory/asthma/en/ (accessed 16 th September 2019)

Chronic diseases such as strokes, ischemic heart disease, and cancer are already some of the major causes of early death in China. Therefore, China's health programmes focus especially on the treatment of cancer and other chronic diseases, such as cardiovascular and cerebrovascular diseases. It is worth noting that the incidence of cancer in China is related to the increase of smoking which in turn is related to social inequalities. Cancer is more represented in provinces than urban areas[31] [32]. Thus, China is trying to solve the health issues in rural areas, using remote diagnosis tools to provide consultation in cooperation with hospitals.

In the EU, chronic diseases are also common pathologies. They represent about 85% of all diseases[33] and are responsible for 86% of all deaths. A major concern is the financial burden linked to their spread: €700 billion each year are spent on treating them in the EU[34].

Metabolic diseases, as mentioned below, are also currently increasing and will become a key challenge in future years as well as lifestyles that lead to obesity and cardiovascular diseases.

According to the survey participants and interviewees, there is still a gap between the technology available and the effective treatment of **chronic diseases** such as cancer in China and the EU. Their eradication requires different therapeutic approaches such as precision medicine oncology, screening of new drug candidates as well as genomic and immunotherapeutic treatment.

Reducing the costs of diagnosis and treatment through technological improvements is essential. Exploring treatment options through Traditional Chinese Medicine (TCM) and Western medicine with the support of collaborative clinical trials would be a further opportunity for cooperation.

Priority	Cancer
Relevance in Europe	**Why is it important?** There were an estimated 3.9 million new cases of cancer and 1.9 million deaths from cancer in Europe in 2018. The most common cancers are lung cancer (20.7 % of all deaths from cancer), breast cancer (15.6% of all deaths from cancer), colorectal cancer (11.7 % of all deaths from cancer), and prostate cancer (5.7 % of all deaths from cancer)[35]. Europe contains 9% of the world population but has a 25% share of the global cancer burden[36]. **How is it supported?** EU research efforts to fight cancer have been ongoing since 1985. These efforts support research to develop patient-oriented strategies to prevent, cure and/or live with cancer. Under the Seventh Framework Programme (FP7; 2007-13), about 1,000 projects received funding totalling €1.6 billion. Under H2020 (2014-20) the current EU framework programme for R&I, 980 projects so far have been funded for €1.2 billion[37].
Relevance in China	**Why is it important?**

[31] https://www.sciencedaily.com/releases/2019/06/190624204851.htm (accessed 16th September 2019)
[32] https://www.bloomberg.com/graphics/2019-china-chronic-conditions/ (accessed 16th September 2019)
[33] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5662668/ (accessed 16th September 2019)
[34] https://ec.europa.eu/health/sites/health/files/major_chronic_diseases/docs/ev_20140403_mi_en.pdf (accessed 16th September 2019)
[35] https://ec.europa.eu/eurostat/statistics-explained/index.php/Cancer_statistics_-_specific_cancers (accessed 30th July 2019)
[36] https://www.sciencedirect.com/science/article/pii/S0959804918309559 (accessed 30th July 2019)
[37] https://ec.europa.eu/info/research-and-innovation/events/special-features/world-cancer-day_en (accessed 30th July 2019)

	In 2015, China had an estimated 4.3 million new cancer cases and 2.8 million deaths from cancer. Cancer alone accounts for 23% of deaths in China[38]. Lung cancer (21.7%) was the leading cancer in men, followed by cancers of the stomach (19.5%), liver (18.1%), oesophagus (10.8%), and colorectum (7.7%). In women, lung cancer (14.3%) also ranked first, followed by breast cancer (14.2%), stomach (12.4%), liver (9.1%), and colorectum (8%)[39]. The five-year survival rate of all cancers in China is 31%, less than half of the 66% survival rate in the United States of America (USA)[40]. In 2015, the survival rate stood at 30%, half the USA level[41]. **How is it supported?** China has now included 17 life-saving cancer drugs on its national public insurance. It has also vowed to improve the five-year cancer survival rate by 15% by 2030 as a part of the Healthy China 2030 Plan.

Priority	Hypertension
Relevance in Europe	**Why it is important?** Hypertension affects nearly 150 million people in Europe, and its prevalence is predicted to rise from 15% to 20% by 2025. [42] High blood pressure remains a serious problem especially in Central and Eastern Europe, including Slovenia, Lithuania and Croatia.[43] **How is it supported?** The 2018 ESC/ESH guidelines on hypertension were promoted with the principal aim to pragmatically improve the diagnostic accuracy of hypertension and the therapeutic efficacy of antihypertensive management, with the challenging scope of improving blood pressure control and reducing the related cardiovascular burden. [44] The vast majority of European countries have developed national guidelines for the primary and secondary prevention of stroke covering all or most of those risk factors.[45]
Relevance in China	**Why it is important?** Hypertension is the most important risk factor for stroke with more than two million people in China having been killed by a stroke in 2016. By comparison, the disease kills around 140,000 Americans each year. A recent study co-authored by Krumholz showed that high blood pressure was more common among Americans, but their Chinese counterparts with the condition were twice as likely to have severe high blood pressure. The data also showed that many people in China with high blood pressure are not aware of their condition.[46]

[38] https://www.cfr.org/blog/finally-china-comes-grips-its-cancer-epidemic (accessed 30th July 2019)
[39] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3643656/ (accessed 30th July 2019)
[40] https://www.scmp.com/news/china/article/1633419/chinas-cancer-survival-rate-just-half-us-new-study-finds (accessed 30th July 2019)
[41] https://www.scmp.com/comment/insight-opinion/article/2168519/long-overdue-step-tackling-cancer (accessed 30th July 2019)
[42] https://www.ahajournals.org/doi/10.1161/CIRCRESAHA.119.314724 (accessed 30th August 2019)
[43] http://www.bloodpressureuk.org/mediacentre/Newsreleases/1billionpeopleworldwidenowhavehighbloodpressure (accessed 30th August 2019)
[44] https://www.ahajournals.org/doi/10.1161/CIRCRESAHA.119.314724 (accessed 30th August 2019)
[45] https://strokeeurope.eu/index/stroke-prevention-in-europe/2-2-hypertension/ (accessed 30th August 2019)
[46] https://www.heart.org/en/news/2018/10/29/chinas-stroke-care-is-improving-but-the-disease-is-still-no-1-killer (accessed 30th August 2019)

	How is it supported? A study done as part of the China Million Persons Project, an ongoing government-funded initiative, found that most primary health centres stocked at least one medication for hypertension, but only 37% stocked all four classes of medication. One in 12 sites did not stock any of these classes of medication.[47] Since 2014, a telemedicine programme has allowed at least 300 rural hospitals to treat stroke patients. [48]

3.2.1.3 Vaccine development

A vaccine is a biological preparation that provides active acquired immunity to a particular disease. It is the most effective method of preventing infectious diseases and is largely responsible for the worldwide eradication of smallpox and the limitation of diseases such as polio, measles and tetanus.

Vaccination is still not affordable or even available in many areas of the world. In the developed countries, a significant issue is the growing scepticism towards vaccines. For example, 90,000 measles cases were recorded in the first half of 2019, across 48 of the 53 countries in the WHO European region[49]. In response to this newly identified threat, the WHO recently launched a call to ask social media to stop publications with misinformation about vaccines[50]. In September 2019, the European Commission and the WHO also launched the first "Global Vaccination Summit" in Brussels to highlight the benefits of vaccination and stop the spread of vaccine-preventable diseases[51].

The scepticism around vaccination efficiency/safety was already highlighted in a 2016 survey. The study showed that trust in vaccines has dramatically decreased in Europe, especially in France, Italy and in Eastern and Southern Europe. China has also reported a lot of scepticism according to Vaccines Safety[52]. This scepticism has grown with the increased use of social media and fake news[53] [54].

To cope with these challenges and to be able to continuously develop **vaccines** (vaccines production, personalised vaccinology, etc.), there is a great need for research in the fields of epidemiological mapping, antibiotic resistance, the complex biology of parasite-host interactions, etc.

[47] https://www.asianscientist.com/2017/11/health/hypertension-silent-killer-china/ (accessed 30th August 2019)
[48] https://www.heart.org/en/news/2018/10/29/chinas-stroke-care-is-improving-but-the-disease-is-still-no-1-killer (accessed 30th August 2019)
[49] https://www.who.int/immunization/newsroom/new-measles-data-august-2019/en/ (accessed 26th September 2019)
[50] https://www.weforum.org/agenda/2019/09/measles-cases-on-rise-across-world-heres-why/ (accessed 16th September 2019)
[51] https://www.who.int/news-room/detail/12-09-2019-vaccination-european-commission-and-world-health-organization-join-forces-to-promote-the-benefits-of-vaccines(accessed 16th September 2019)
[52] https://www.ebiomedicine.com/article/S2352-3964(16)30398-X/fulltext (accessed 16th September 2019)
[53] https://www.who.int/news-room/detail/04-09-2019-vaccine-misinformation-statement-by-who-director-general-on-facebook-and-instagram (accessed 16th September 2019)
[54] https://www.hsph.harvard.edu/ecpe/vaccines-social-media-spread-misinformation/ (accessed 16th September 2019)

Priority	Vaccination
Relevance in Europe	**Why it is important?** Rigorous vaccination campaigns have already eradicated some diseases while others still remain a threat, such as measles and congenital rubella[55]. One of the most remarkable examples is the measles vaccine campaign. Between 2000 and 2017, measles vaccination prevented an estimated 21.1 million deaths according the WHO[56]. The European Vaccine Action Plan 2015-2020 was drafted to complement and adapt the Global Vaccine Action Plan in harmony with Health 2020. The "aim of the global policy is to ensure that the full benefit of vaccination is available to all people". One of the most important facts is that "of the 11.2 million children born in the European Region in 2012, nearly 554,150 did not receive the complete three-dose series of diphtheria, pertussis and tetanus vaccine by age one"[57]. **How is it supported?** The EU MS have no common policies regarding vaccines. Some of them are obligatory while others are simply recommended. Countries make their own decisions regarding vaccine politics[58, 59]. As said previously, vaccination campaigns are supported by the countries themselves and the European Vaccine Action Plan 2015–2020[60].
Relevance in China	**Why is it important?** In a 2019 peer-reviewed paper about the importance of tuberculosis vaccination targeting older people in China, the authors stated that tuberculosis fighting actions will not reach the WHO goals and new vaccines are urgently needed[61]. Some vaccines are not offered under the government's Expanded Program on Immunization and therefore are expensive. A 2019 study shows that the rate of travel-related infections in China is increasing[62]. Amongst them tuberculosis, hepatitis A virus, blood-transmitted and sexually transmitted infections, dengue fever and malaria. **How is it supported?** China produces 700 million doses of vaccines per year[63]. Between 2007 and 2015, the annual supply in China ranged between 666 million and 1,190 million doses, produced domestically.

[55] https://ecdc.europa.eu/en/immunisation-vaccines/facts/vaccine-preventable-diseases (accessed 12th August 2019)
[56] https://www.who.int/news-room/fact-sheets/detail/measles (accessed 12th August 2019)
[57] http://www.euro.who.int/__data/assets/pdf_file/0007/255679/WHO_EVAP_UK_v30_WEBx.pdf?ua=1 (accessed 12th August 2019)
[58] https://vaccine-schedule.ecdc.europa.eu/Scheduler/ByDisease?SelectedDiseaseId=8&SelectedCountryIdByDisease=-1 (accessed 12th August 2019)
[59] http://apps.who.int/immunization_monitoring/globalsummary/schedules (accessed 12th August 2019)
[60] http://www.euro.who.int/en/health-topics/disease-prevention/vaccines-and-immunization/publications/2014/european-vaccine-action-plan-20152020-2014 (accessed 12th August 2019)
[61] Harris R.C et al.(2019) Age-targeted tuberculosis vaccination in China and implications for vaccine development: a modelling study. *The Lancet.* DOI: https://doi.org/10.1016/S2214-109X(18)30452-2; https://www.thelancet.com/journals/langlo/article/PIIS2214-109X(18)30452-2/fulltext (accessed 12th August 2019)
[62] Zhang L, Wilson DP (2012) Trends in Notifiable Infectious Diseases in China: Implications for Surveillance and Population Health Policy. PLoS ONE 7(2): e31076. DOI: https://doi.org/10.1371/journal.pone.0031076
[63] "The landscape of vaccines in China: history, classification, supply, and price"; Zheng et al. BMC Infectious Diseases 2018 https://doi.org/10.1186/s12879-018-3422-0 (accessed 12th August 2019)

	This is organised through the China National Immunization Programme[64], a government and academic organisation that contributes to the control, elimination and eradication of vaccine-preventable diseases in China. Vaccines are made available through the government's Expanded Program on Immunization[64].

3.2.2 EU-China main health related "societal" trends

3.2.2.1 Ageing and related diseases

In 2050, the global population aged 60 years or over will reach nearly 2.1 billion (1.3 billion in Asia – 478,861,000 in China - and 247.2 million in Europe) and the population 80 years or over is expected to reach 425 million[65]. As life expectancy increases worldwide, social transformations will be necessary, with implications in healthcare and sustainable social protection system[66]. Some common health conditions associated with ageing were mentioned by interviewees:

- As the population gets older, the demand for medicines increases, and in turn the burden for the R&D of medicines. The increased pressure on the healthcare system will make it unaffordable for patients to buy medicines. For example, by 2050 only 25% of the population in China and 13% in Europe[67] will be working, increasing the financial burden of the elderly on young people.
- Europe and China are also facing an increase of mental health problems and degenerative diseases in the elderly, said the interviewees. The total cost of mental health issues in 2013 accounted for more than 15% of the total health expenditure in China[68] and more than 4% in Europe[69].

Ageing will be an important challenge for the next decade and the survey participants are aware that solutions need to be developed. Nowadays, China's social insurance system is not able to cover all expenses of the health R&D and it is becoming urgent to improve the social insurance system to take better care of elderly and sick people. To improve China's medical system, it is important to connect directly with local governments via matchmaking to further enhance the policy dialogue.

The implementation of the European concept of day-care centres is also something to consider in order to take care of the elderly.

Creating solutions relies on new technologies - more and more tech-companies are developing, for example, digital tools to facilitate the communication with the elderly and help them be more independent.

[64] https://www.who.int/vaccine_safety/initiative/communication/network/china_nip/en/ (accessed 12th August 2019)

[65] United Nations, Department of Economic and Social Affairs, Population Division (2017). World Population Ageing 2017 - Highlights (ST/ESA/SER.A/397). (accessed 18th September 2019)

[66] https://www.un.org/en/development/desa/population/publications/pdf/ageing/WPA2017_Highlights.pdf (accessed 18th September 2019)

[67] https://www.imf.org/external/pubs/ft/fandd/2017/03/lee.htm (accessed 18th September 2019)

[68] Xu J, Wang J, Wimo A, Qiu C. The economic burden of mental disorders in China, 2005-2013: implications for health policy. BMC Psychiatry. 2016;16:137. Published 2016 May 11. doi:10.1186/s12888-016-0839-0 (accessed 18th September 2019)

[69] https://read.oecd-ilibrary.org/social-issues-migration-health/health-at-a-glance-europe-2018/summary/english_52181165-en#page1 (accessed 18th September 2019)

3.2.2.2 Digital medicine and artificial intelligence to support preventive medicine and diagnostics

Digital medicine, artificial intelligence (AI) and computation, Information and Communication Technology (ICT) as well as eHealth and medical devices are predominant trends that are being explored in Europe as well as in China.

This could be an important collaboration area, as the research results are of major relevance to support and improve the efficiency of prevention, diagnostics and treatment, but also for providing consultation in remote areas. For example, predictive medicine (helping to better predict medical outcomes) allows patient' care at an early stage of the disease. Furthermore, AI could be a good basis to develop omics technologies.

The challenge for cooperation in this area lies in in the heterogeneity of the data that is collected. Furthermore, according to the interviewees, better coordination in technology and communication is necessary to discuss technology gap in the health sector and difficulties in cooperation between China and Europe in medicine and technology.

3.2.2.3 Development of innovative drugs at an affordable price

Nowadays, the generic drugs market produced in China is growing rapidly, supporting the development of drugs at an affordable price. In 2015, for example, the generic drugs market sales reached 614.8 billion RMB[70]. But, the development of more efficient drugs at an affordable price is a real challenge for the next decade. Indeed, treatment options for many major diseases are already available, however, the main issue is their high price and the lack of reimbursement. For example, some gene therapies for rare diseases are very costly such as the Zolgensma™ from Novartis – the cost of a single treatment, is about $2-$4 million USD[71]. The treatment is not reimbursed by health insurances in Europe, in 2019[72]. For the present and immediate future, process development to reduce costs, improve yields and product quality is critical as health R&I moves even more towards biopharmaceuticals.

Technology management could be a key for cost reduction. Indeed, development of new drugs could be supported by technologies, such as AI, reducing development time. In 2019, two start-ups, in Hong-Kong and Toronto, have respectively identified a potential new drug within 46 days[73] and designed a drug in 21 days[74].

New technologies for biopharmaceuticals are being developed all the time both for upstream and downstream treatment. Integrating the whole production train, in particular under continuous, closed conditions, will remain to be very relevant.

As collaboration between China and the EU has been strengthened, there are more medical and pharmaceutical products from China in the EU (improvement of data sharing and recognition), even if the pharmaceutical environment is different in the two regions. Development of innovative drugs at an affordable price has many benefits to reinforce this collaboration.

[70] https://www2.deloitte.com/content/dam/Deloitte/ch/Documents/life-sciences-health-care/ch_Studie_Pharmaceutical_China_05052014.pdf (accessed 13th August 2019)
[71] https://www.reuters.com/article/us-novartis-genetherapy/novartis-2-million-gene-therapy-for-rare-disorder-is-worlds-most-expensive-drug-idUSKCN1SU1ZP - Reuters Agency; May 2019 (accessed 13th August 2019)
[72] https://smanewstoday.com/2019/06/13/european-sma-advocates-question-eu-willingness-reimburse-zolgensma/ (accessed 26th October 2019)
[73] https://www.technologyreview.com/f/614251/an-ai-system-identified-a-potential-new-drug-in-just-46-days/ (accessed 18th September 2019)
[74] https://www.forbes.com/sites/alexknapp/2019/09/02/this-startup-used-ai-to-design-a-drug-in-21-days/#2fa1e7ae2594 (accessed 18th September 2019)

3.2.2.4 Improving knowledge to support translational and predictive medicine

Long-term, there is a need to improve basic knowledge on personalised medicine (new markers and models) in particular for progressive diseases – as well as rare diseases. Coupled with this "improvement of knowledge", preparing for translational steps requires development of advanced therapies.

A definition of translational research is given by the journal Nature "*Translational research involves the application of knowledge gained through basic research to studies that could support the development of new products. For example, translational research in the field of medicine may involve using knowledge of the biology of a disease to identify and evaluate chemical compounds in disease models, with a view to selecting potential candidate drugs to advance into clinical trials*." [75] Translational medicine could be a good strategy for developing targeted therapies for precision medicine[76].

The evaluation of new molecules could be improved and supported by using hybrids of human organs (not organoids but real organs, e.g. donated from dead bodies) and biotechnological methods for drug testing, largely benefits from a flexible regulation in China. However, it is essential that the drugs issued from these R&D were developed and produced at affordable price and reimbursed.

Table 2: How to support health R&I priorities?

Infectious diseases	Chronic diseases	Vaccines
▪ Viral diseases (ZIKA, Ebola, Avian flu, HIV, Hepatitis B, malaria); ▪ Emerging and remerging disease ▪ Bacterial infection and antibiotic resistance.	▪ Chronic diseases and cancer treatment; ▪ Diabetes, hypertension, ▪ Heart diseases ▪ Cancer (e.g. lung, breast, gynaecologic and skin); ▪ Environmental impact on health (asthma).	▪ Studies on complex biological processes in poverty-related diseases; ▪ Process development for vaccines production; ▪ Personalised vaccinology; ▪ General studies in vaccines.
Other		
Ageing; metabolic diseases (obesity, cardiovascular diseases); rare diseases: neurodegenerative disease and mental health problems		
How to handle and support these challenges?		
Improving funds for health R&I – Tackling medical socioeconomics challenges Harmonisation of regulations/rules, data sharing and data analysis Best practices: ethics, patients' consent, GDPR, clinical trials, social security system, the day care centre		
▪ eHealth; ▪ Artificial intelligence; ▪ Digital medicine and computation; ▪ Medical devices; ▪ Predictive medicine and diagnostic; ▪ Personalised medicine; ▪ Genomic, "Omics", gene sequencing; ▪ Biotechnologies; ▪ immunotherapy.		▪ Biopharmaceutical innovation: macromolecules medicine; new products and screening of new drug candidates; innovative medicines; ▪ Translational research/medicine ▪ Precision Drugs and targeted treatment development ▪ TCM.

[75] https://www.nature.com/subjects/translational-research (accessed 26th October 2019)
[76] https://www.targetedonc.com/publications/targeted-therapy-news/2019/september-2019/future-lung-cancer-research-requires-a-precision-medicine-ecosystem (accessed 26th October 2019)

3.3 Priorities of the latest H2020 Health Work Programme (2018-2020)

The latest H2020 Health Work Programme (2018-2020) establishes a set of priorities. The survey participants were asked to rank these priorities. The results of this ranking are presented in the table below:

Table 3: H2020 Health Work Programme (2018-2020) priorities ranked by survey participants

H2020 priorities	Rank [*more relevant - less relevant*]						
	1	2	3	4	5	6	7
	Number of answers						
Personalised medicine	6	5	6	3	2	1	1
Infectious diseases and improving global health	5	2	2	1	5	7	2
Innovative healthcare system - Integration of care	4	4	2	3	1	4	6
Decoding the role of the environment, including climate change, for health and wellbeing	3	2	3	3	6	2	5
Enable better access to healthcare for patients	2	5	5	4	2	5	1
Innovative health and care industry	2	5	2	5	5	1	4
Ensure the sustainability of health and care systems	2	1	4	5	3	4	5

What are the three most relevant priorities set by H2020 Health Work Programme according to the survey participants?

1st Personalised medicine

2nd Infectious diseases and improving global health

3rd Innovative healthcare system - Integration of care

3.4 Priorities of the State Council of the People's Republic of China

The State Council of the People's Republic of China has also established a set of priorities. The survey participants were asked to rank these priorities. The results of this ranking are presented in the table below:

Table 4: The State Council of the People's Republic of China priorities ranked by survey participants

The State Council of the People's Republic of China priorities	Rank [*less relevant - more relevant*]						
	1	2	3	4	5	6	7
	Number of answers						
New Drugs Development for major disease	4	0	0	1	4	3	11
Prevention and control of chronic diseases	2	0	2	0	3	7	9
Prevention and treatment of major infectious diseases	1	2	1	3	1	6	9
Promoting science and technology innovation in health care	0	0	3	1	6	5	7
Delivery of high quality and efficient medical care	0	2	2	4	7	2	5
Improving TCM	4	2	5	4	4	4	1

What are the three most relevant priorities set by the State Council of the People's Republic of China according to the survey participants?	
1st	New Drugs Development for major disease
2nd	Prevention and control of chronic diseases
3rd	Prevention and treatment of major infectious diseases

Infectious diseases are a key priority for collaboration, as the topic has been selected in both H2020 and Chine programmes, as shown below:

Table 5: Synthesis of health priorities in the EU/China according to the survey and interview participants

H2020 Health Work Programme priorities	The State Council of the People's Republic of China priorities
Personalised medicine	New Drugs Development for major disease
Infectious diseases and improving global health	Prevention and control of chronic diseases
Innovative healthcare system - Integration of care	**Prevention and treatment of major infectious diseases**

4 Current assessment of researchers' participation in H2020 projects and Chinese programmes

4.1 Overview of Chinese participation in the H2020 priorities topics

Overall, China has signed 189 H2020 grants accounting for 0.77% of the total amount of H2020 signed grants. China has also participated in 412 H2020 projects as a third-country partner making up 0.35% of the total participations in the programme[77], **which is the second highest participation rate of any third country in H2020 projects** (Figure 9).

[77] (https://webgate.ec.europa.eu/dashboard/sense/app/a976d168-2023-41d8-acec-e77640154726/sheet/e1b57f9a-669b-4962-bdb9-0151c523120f/state/analysis) and https://webgate.ec.europa.eu/dashboard/sense/app/a976d168-2023-41d8-acec-e77640154726/sheet/0c8af38b-b73c-4da2-ba41-73ea34ab7ac4/state/analysis (accessed 12th August 2019)

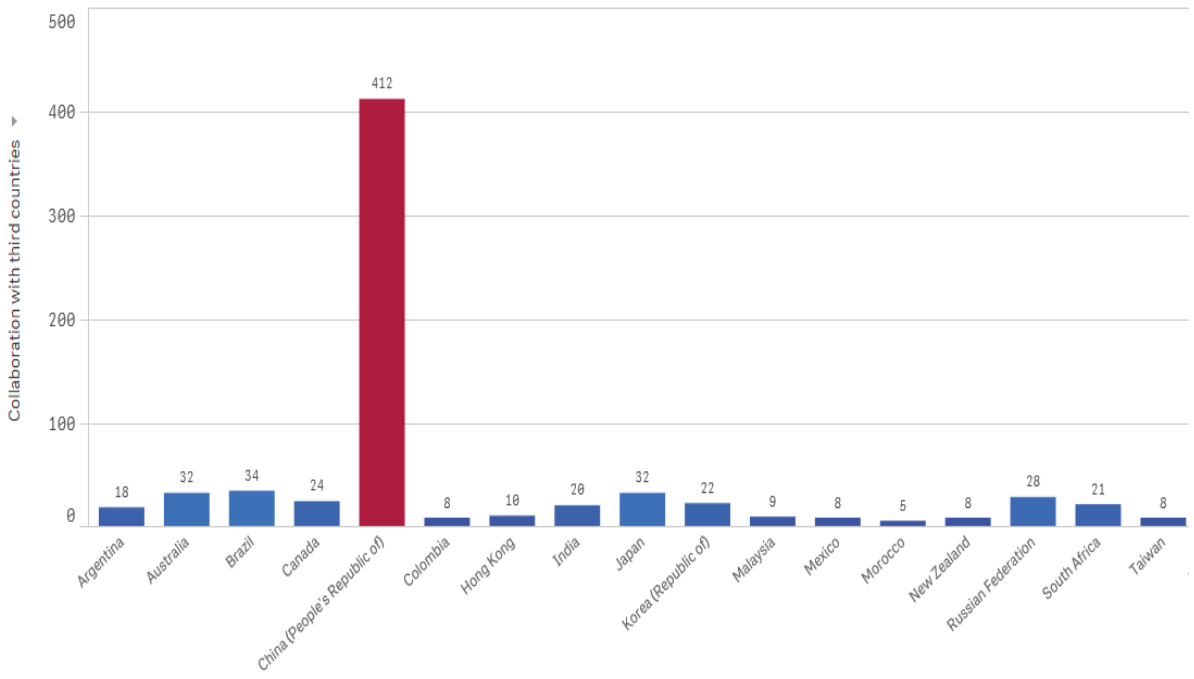


Figure 9: China as a third-party partner in H2020 projects

As shown below, China mostly participates in Marie-Sklodowska-Curie Actions and projects related to the thematic area "Food security, sustainable agriculture and forestry, marine and maritime and inland water research and bioeconomy" (Figure 10).

Figure 10: Participation of China in H2020 programmes[78]

[78] https://webgate.ec.europa.eu/dashboard/sense/app/a976d168-2023-41d8-acec-e77640154726/sheet/d23bba31-e385-4cc0-975e-a67059972142/state/analysis (accessed 30th September 2019)

4.2 Participation of Chinese organisations in H2020 health projects

Analytical data derived from the EU programmes statistic portal was examined[79]:

In the H2020 "Health, Demographic Change and Wellbeing" work programme, only eight Chinese organisations participated / are participating. Four out of these eight organisations are partners in the SENET project:

- Beijing University of Chinese Medicine (BUCM);
- China National Centre for Biotechnology Development (CNCBD);
- China National Health Development Research Centre (CNHDRC, PRC);
- Science and Technology LinkedIn (S&T LinkedIn).

China has only signed five out of 914[80] H2020 grants in "Health, Demographic Change and Wellbeing" **representing 0.02% of total grants signed in the H2020 work programme** (section 4.2.2): SENET, ZIKAlliance, PRODEMOS and Ageing with elegans.[81] The fifth project, IDIH, was launched in May 2019.

4.2.1 EU-China Co-Funding Mechanism (CFM)

To support joint projects between European and Chinese universities, research institutions and companies in the H2020 work programme, the Chinese Government and the EU agreed to set up a Co-Funding Mechanism for R&I[82].

In 2015, the Ministry of Science and Technology of the People's Republic of China (MoST) announced their first call for proposals under the 1st EU-China Health Summit EU-China Co-Funding Mechanisms for Research and Innovation. The CFM paves the way for a deepened cooperation between European and Chinese R&I stakeholders by promoting a stronger and more balanced Chinese participation in the H2020 topics targeting cooperation with China. The CFM is designed to support mainland-China-based R&I organisations participating in H2020 projects.

Before applying to the China Science and Technology Exchange Centre (CSTEC), the H2020 project which the Chinese organisation is involved in, should have already been approved by the EC. In other words, **a signed H2020 Grant Agreement with the EC is necessary for the Chinese organisations to be able to apply to the CFM**.

Within the CFM, the Ministry of Finance of the People's Republic of China has announced that the central government has recently established a plan for funding the health system to solve issues on overlapping projects in the field of health, decentralised management and integrating funding.

As mentioned in the "Scoping paper: Review on health R&I priorities in Europe and China", the Chinese Government and the EU have agreed to set up a CFM on R&I to support joint projects in a large variety of health topics:

- Under the "**EU-China Flagship Initiatives**"[83], the EC and the National Natural Science Foundation of China (NSFC) promote **health biotechnology** within the topic "NMBP-21-2020: Custom-made biological scaffolds for specific tissue regeneration and repair";
- Under the nine priority areas of common interest eligible for co-funding, MoST[84] supports **bio-pharmaceuticals, precision medicine, high performance medical devices, prevention and**

[79] https://webgate.ec.europa.eu/dashboard/sense/app/93297a69-09fd-4ef5-889f-b83c4e21d33e/sheet/a879124b-bfc3-493f-93a9-34f0e7fba124/state/analysis (accessed 07th August 2019)

[80] https://webgate.ec.europa.eu/dashboard/sense/app/93297a69-09fd-4ef5-889f-b83c4e21d33e/sheet/erUXRa/state/analysis (accessed 12th August 2019)

[81] https://webgate.ec.europa.eu/dashboard/sense/app/a976d168-2023-41d8-acec-e77640154726/sheet/0c8af38b-b73c-4da2-ba41-73ea34ab7ac4/state/analysis (accessed 12th August 2019)

[82] https://ec.europa.eu/research/participants/data/ref/h2020/other/hi/h2020_localsupp_china_en.pdf (accessed 12th August 2019)

[83] https://euraxess.ec.europa.eu/worldwide/china/flagship-initiatives-calls-targeting-china-2018-2020-workplan-horizon-2020 (Accessed 20th August 2019)

[84] https://ec.europa.eu/research/participants/data/ref/h2020/other/hi/h2020_localsupp_china_en.pdf (Accessed 20th August 2019)

treatment of major infectious diseases, antibiotic resistance, regenerative medicine, medical big data, medical robots, aging services technology, TCM, and has published its first call for proposals for the year 2019;

- Other topics targeting the participation of China in H2020 work programme 2018-20[85] are:
  - SC1-HCO-11-2018: Strategic collaboration in health R&I between EU and China;
  - SC1-HCO-01-2018-2019-2020: Actions in support of the International Consortium for **Personalised Medicine**;
  - SC1-HCC-03-2018: Support to further development of international cooperation in **digital transformation of health and care**.

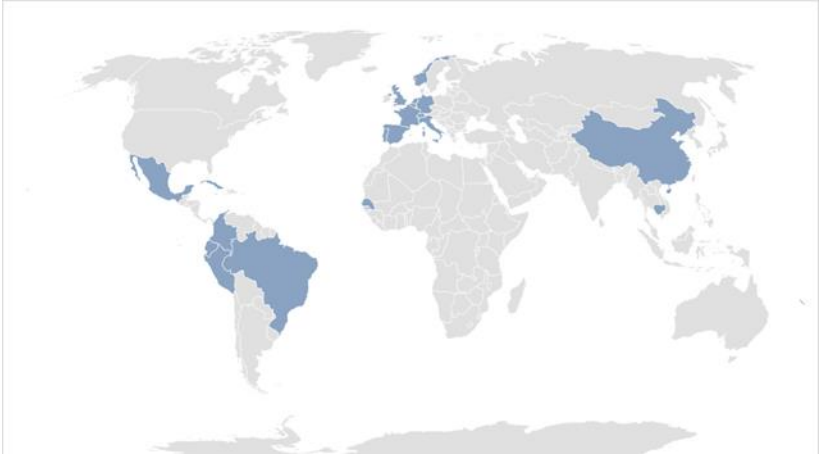
4.2.2 H2020 success stories

Some collaborative H2020 projects between the EU and China have been real success stories for health research. The following projects are funded under the "Health, Demographic Change and Wellbeing" work programme (the same work programmes that funds SENET):

<table>
<tr><th colspan="2">ZIKAlliance</th></tr>
<tr><td colspan="2">Project description: A global alliance for Zika virus control and prevention
ZIKAlliance is a multidisciplinary project with a global "One Health" approach, built on a multi-centric network of clinical cohorts in the Caribbean, Central & South America; research sites in countries where the virus has been or is currently circulating (Africa, Asia, Polynesia) or at risk for emergence (Reunion Island); a strong network of European and Brazilian clinical & basic research institutions; and multiple interfaces with other scientific and public health programmes.</td></tr>
<tr><td>Programme:
H2020-EU.3.1.3. - Treating and managing disease</td><td>Topic:
SC1-PM-22-2016 - Addressing the urgent research gaps against the Zika virus and other emerging threats in Latin America

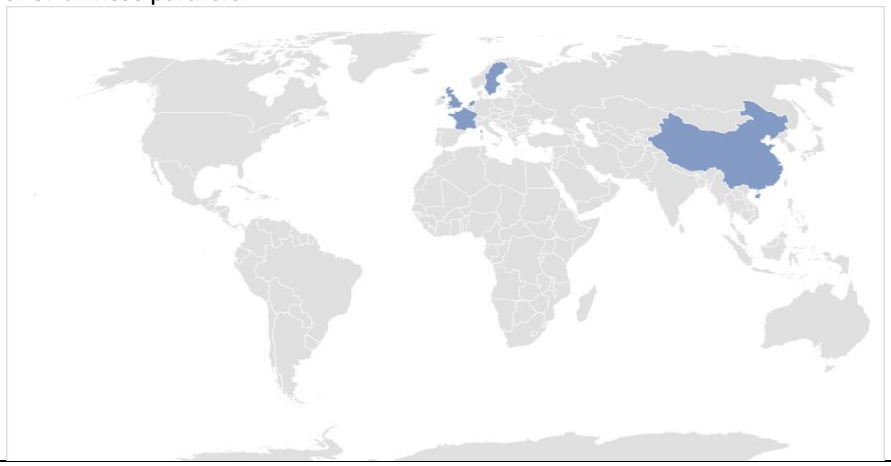
R&I action</td></tr>
<tr><td>Timeline:
1 October 2016 - 30 September 2020</td><td>Overall budget: € 15,684,925.99
EU contribution: € 11,964,209</td></tr>
<tr><td colspan="2">Partners:
• Number of EU partners: 40
• Number of Chinese partners: 1
• Number of other partners: 8 from South America, 3 from the Caribbean and Central America, 1 from Asia and 1 from Africa</td></tr>
</table>

[85] https://euraxess.ec.europa.eu/worldwide/china/other-horizon-2020-calls-targeting-china (Accessed 20th August 2019)

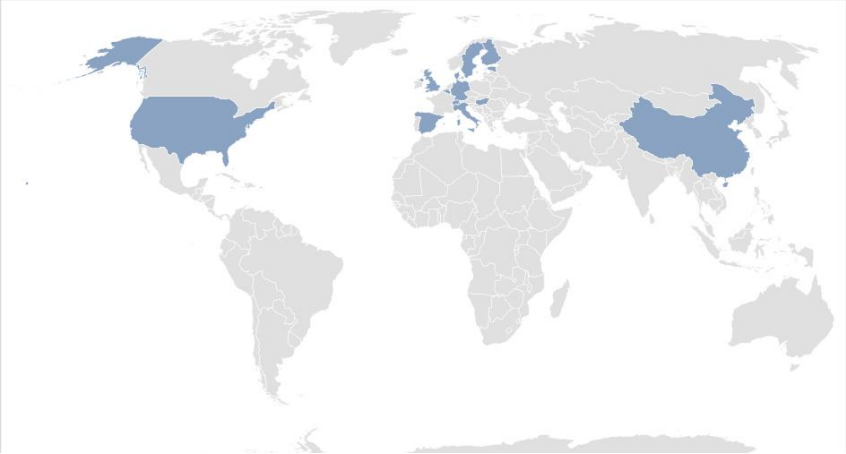


Links: http://cordis.europa.eu/project/id/734548

PRODEMOS	
Project description: Prevention of Dementia using Mobile phone applications. The predicted steep rise in global dementia prevalence will largely occur in low and middle-income countries (LMIC) and vulnerable populations in high-income countries (HIC). Up to 30% of all dementia is attributable to potentially adjustable risk factors. Mobile Health (mHealth) technology allows for scalable and widely implementable prevention programmes using self-management for improvement of dementia risk factors. Objective: To make dementia prevention strategies accessible to populations in LMIC and vulnerable populations in HIC using mobile health technology.	
Programme: H2020-EU.3.1.3. - Treating and managing disease	**Topic:** SC1-HCO-07-2017 - Global Alliance for Chronic Diseases (GACD) prevention and management of mental disorders R&I action
Timeline: 1 January 2018 - 31 December 2022	**Overall budget:** € 2,999,097.50 **EU contribution:** € 2,465,041.25
Partners • **Number of EU partners:** 6 • **Number of Chinese partners:** 1	



Links: http://cordis.europa.eu/project/id/779238

Ageing with elegans	
Project description: Validating C. elegans health span model for better understanding factors causing health and disease, to develop evidence-based prevention, diagnostic, therapeutic and other strategies. Health span (the life period when one is generally healthy and free from serious disease) depends on nature (genetic make-up) and nurture (environmental influences, from the earliest stages of development throughout life). Genetic studies increasingly reveal mutations and polymorphisms that may affect health span. Similarly, researchers found out that lifestyle modifications or treatments are improving health span. In both cases, rigorous testing is hampered by the long lifespan of model organisms like mice (let alone humans) and the difficulty of introducing genetic changes to examine the phenotype of the altered genome. We will develop C. elegans as a health span model.	
Programme: H2020-EU.3.1.1. – Understanding health, wellbeing and disease	**Topic:** PHC-01-2014 - Understanding health, ageing and disease: determinants, risk factors and pathways R&I action
Timeline: 1 May 2015 – 30 April 2020	**Overall budget:** €7,305,146 **EU contribution:** € 6,573,680.50
Partners • **Number of EU partners:** 15 • **Number of Chinese partners:** 1 • **Number of other partners:** 2 	
Links: https://cordis.europa.eu/project/rcn/193245/factsheet/en	

4.2.3 Sino-European collaborative success stories

Several Sino-European success stories were listed by the Chinese interviewees:

- China has made several medical investments in Europe. For example, China's Luye Pharma Group acquired AstraZeneca's core Central Nervous System products - Seroquel and Seroquel XR. China has also cooperated with many European pharmaceutical companies on R&D projects as well as industrial projects.
- China's Tiantan Clinical Trial and Research Centre for Stroke has been cooperating with the European project CHANCE (Clopidogrel in High-risk patients with Acute Non-disabling Cerebrovascular Events). The project aims to develop innovative pharmaceuticals for stroke patients. The project was successfully set up in China with the support of the pharmaceutical firm Sanofi;

- The Wuhan national bio-safety level four lab of the Chinese Academy of Sciences (Wuhan P4 lab) is part of a Sino-French cooperation in prevention and control of emerging infectious diseases. The Wuhan P4 lab conducts research on anti-virus drugs and vaccines. This laboratory is a good example of a successful cooperation that supports the collaboration of a team of experts and the introduction of the developed technologies to the French market.
- The National Health Service (NHS) in Great Britain and China have a cooperation agreement on Sino-British Medical Science and Technology Innovation. The UK has strong innovative healthcare capabilities, particularly regarding pharmaceutical products, biosciences, medical devices and equipment. The medical and hospital cooperation between China and Europe should be more commercialised, getting supports from the innovation business.
- Another collaborative initiative has been developed between China and the Netherlands (Thuiszorg.nl) in Shanghai. The aim of this initiative is to understand and identify the cultural differences in the treatment of elderly people between the EU and China. By better understanding the main differences, they were able to provide a service that better suits the Chinese needs.
- Philips and Digital China Health, a large cloud platform for healthcare and patient analysis, have made the cooperation project on tele-radiology services in China. This project helps primary and remotely located (in rural areas of China) hospitals in China to enhance the access and quality of care. The partnership between Philip and Digital China Health is intended to connect foreign and domestic professional health technology organizations, aiming to develop AI-driven precision medicine in China.

4.3 Main drivers and obstacles of working in a collaborative project

Several survey participants and interviewees are interested in programmes that would allow them to work with China/the EU. Some have already been participating in a collaborative project. In regard to H2020 and Chinese programmes, survey participants clearly expressed their interest for more joint project opportunities.

One recurring issue is that EU-China collaboration is of high interest as it allows participants to access funds, to extend their network, develop new fields of research and reinforce their research teams in a new project across the board.

Regarding H2020 and Chinese programmes, besides having access to funding that otherwise would be inaccessible and being part of a project that otherwise would not be accessible, researchers would have a lot of benefits to work with experts from other countries and other fields of knowledge and learn from them, but they are also interested in sharing their knowledge with partners.

For the majority of researchers who have participated in a H2020 or Chinese programme before, no specific problems occurred during the project. Nevertheless, some of them reported complicated procedures at home/host organisation, insufficient funds and language problems.

4.4 Challenges and recommendations for participation in H2020 /Chinese programmes

The survey participants and interviewees shared interesting experiences regarding programmes and health priorities. They highlighted that:

- Research institutes need a better understanding of the H2020 priorities;
- Budget and administrative steps are an important issue to collaborate on;
- H2020 programme and CFM links must be reinforced, and the application process aligned.

As they think that universities seem not to have enough authority, it is important to include the health departments of the government as well as staff from hospitals and clinics in the discussion.

4.4.1 Research institutes need a better understanding of the H2020 priorities

Although the H2020 and Chinese work programmes are widely disseminated, common health priorities are not fully identified and understood by the researchers. The H2020/Chinese and programmes have complex schemes and too many instruments. It is difficult for a researcher to find a specific topic.

In fact, according to the survey participants, the H2020 programme can seem difficult to access. Indeed, even though well-known topics are clearly defined in the programme, calls sometimes appear to be very broad. One may think that a large range of priorities would allow many researchers to apply to the H2020 work programme, however, the reality is different. With no specific disease pointed out in the calls (e.g. calls targeting one specific disease and clearly stating the expected impact), researchers sometimes fear that their research topic is not a priority. As they know competition is strong, they decide not to apply. Indeed, interviewees from China and Europe agreed that writing a proposal is time-consuming and very expensive, especially considering the risk of not having their proposal accepted.

Besides this major barrier, the following points also prevent researchers to prepare proposals answering H2020 calls, according to the answers reviewed:

- Clinical trials, an important part of health research, do not seem to be considered enough in the calls;
- H2020 is less focused on fundamental research than the previous programmes FP6/FP7 (too much focus on pharmaceutical research / close to market).
- H2020 involves more SMEs. Opening up to the economic sphere can worry some researchers.
- A significant concern was also raised on the “open data pilot” promoted by the EC, as health data needs to be treated carefully.

To increase researchers’ participation in H2020 calls:

- Researchers would expect their field of research to be specifically named in the call, in order to reduce competition and be sure they meet the EC’s expectations;
- EU priorities should be more highlighted at a national level;
- Calls should focus more on clinical trials, as it a prevalent point for health research.

4.4.2 Applicants expect reinforced administrative support

The interviewees further highlighted the issues related to the **application process** itself in the EU and China. Researchers have major concerns regarding the preparation and submission phases as well as the project management after receiving funding. Many calls encourage “cross-sectoral and interdisciplinary” teams to apply, which in the interviewees’ eyes, is not always necessary. Some challenges can also be tackled by a small team without external competence (e.g. big data/IT).

Finding the right partners is not always easy. It may be difficult for a newcomer to join a consortium. It is indeed necessary that the potential applicant receives public recognition or is a member of a well-known network in order to enter a consortium easily. In addition, it can be risky to do a project with an institution you have never worked with before.

Besides identifying partners, researchers do not always have a large enough budget or enough time to develop a project designed for H2020 and the CFM. Indeed, the H2020 proposal writing phase is time-consuming and **very competitive** for Chinese and European participants. Also, the preparation of the proposal may require travel, which can be very expensive. Furthermore, regarding the submission process, the researchers stated that the application procedures are complex.

Considering funded projects, interviewees said that more budget is necessary to manage the project, as consortia are formed from many participants.

- At the national level, it is recommended to **reinforce the support for applicants at universities** (e.g. European services in universities) and to promote NCPs or EEN networks within the research laboratories.
- At the EU level, **building a researchers network** between the EU and China could help to find partners and join a consortium.
- At the international level, **NCP networks should be supported and developed more in China.**

4.4.3 Reinforcing H2020/collaborative programme and CFM links

The following difficulties regarding the co-funding mechanism were identified:

- To apply to a European programme, a European coordinator is needed. Vice versa, if applying to a Chinese programme, having a Chinese researcher as a coordinator is needed;
- Most of the Chinese calls are bilateral calls launched between China and a **specific** European country. Interviewees suggested that the number of collaborative projects could be increased if there were **less bilateral calls and more calls applying to the entire EU**.
  In these bilateral calls, only one proposal is written, and funding will be granted **automatically** from both sides (the European country and China). This procedure appears to be **more effective than the CFM.** In fact, the scheme of applying for funding from a Chinese funding authority in an independent proposal is too long and difficult;
- The EU funding is a necessary preliminary for Chinese applicants to submit a co-funding application in China. It means that Chinese partners will not be directly funded at the beginning of an H2020 project. This is more likely to lead to a **lack of participation of the Chinese partners**, and therefore a **lack of proper collaboration**;
- To be funded, a consortium must be composed of researchers from at least three different countries or more depending on the budget. This condition has proved to be difficult for researchers to meet in some cases;
- A major barrier for Chinese applicants is that the H2020 Participant Portal is not in Chinese.

To counterbalance these factors, interviewees suggested the following ideas:

- The Chinese government needs to establish methods to promote synergies with the European governments through a **cooperation platform**;
- Create a **central database** for all calls in order to gather all information in the same place. This way the organisations and the researchers could easily have access to information about EU/Chinese cooperation and opportunities (e.g. which call is dedicated to collaboration EU/China or mobility).
- **Training, matchmaking and education** for H2020 and Chinese work programmes are needed in order to better understand the programmes from both sides (e.g. other supporting initiative as EURAXESS).
- **Role of the agreements** that were signed between the EU/EU MS and China also needs to be put forward. This could be done in naming the agreements in collaborative projects;
- Making clear in the call description that Chinese teams have to be involved would be useful to identify collaboration opportunities and proposing more joint/specific calls between specific countries and China;
- More co-funding mechanisms need to be proposed to Chinese participants.

5 Assessment of researcher mobility

Researcher "mobility" refers to researchers moving during their career, which can be for different lengths of time, with different goals.

The report "Map of major funding agencies and stakeholders in Europe and China" focuses on main funds available for researchers' mobility. Several programmes are dedicated to improving the mobility of European or national (including China) researchers and students and propose various conditions to apply, funding and length covering a lot researcher's needs.

Regarding programmes to support outgoing researchers, most countries propose programmes towards younger researchers at the postdoctoral level or equivalent. The survey and interviews have helped to highlight the current mobility situation.

5.1 Researcher mobility programmes

5.1.1 Researcher mobility programmes at European level

5.1.1.1 Marie Sklodowska-Curie Actions

The Marie Sklodowska-Curie Actions (MSCA) are the most important researcher mobility programme in the EU. It helps researchers go to other EU countries but also to third countries, providing them with different types of grants. Grants provided by the MSCA are available for all stages of a researcher's career. Fellows including Ph.D. candidates and those carrying out more advanced research. The EU has set aside EUR 6.16 billion on researcher training and career development to be spent by 2020.

- Innovative Training Networks drive scientific excellence and innovation by bringing together universities, research institutes and other sectors from across the world to train researchers to doctorate level;
- Individual Fellowships are an excellent opportunity for experienced researchers looking to give a boost to their carrier by working abroad;
- The Research and Innovation Staff Exchange funds short-term exchanges of personnel between academic, industrial and commercial organisations throughout the world. It helps people to develop their knowledge, skills and careers, whilst building links between

organisations working in different sectors of the economy, including universities, research institutes and SMEs;

- Co-funding of regional, national and international programmes provide organisations with additional financial support for their own researcher training and career development programmes. The extra funds are available for new or existing schemes for training researchers abroad and across various sectors.

During the H2020 period (2014-2020), a total of 962 Chinese researchers were involved in 81 MSCA projects in Europe, while 510 European researchers went to China. This points out that the mobility rate is not equal between Chinese and European researchers.

Table 6: Key facts and figures (2014-2020) for the participation of China in MSCA[86]

In detail, the number of the organisation participations and the budget awarded to them, as well as the number of researcher mobilities involving these organisations:

Action	Number of Participations of CN organisations*		EU contribution (in EUR million) to CN organisations	Number Of Projects	CN researchers involved	Researchers going to CN organisations
COFUND	8	*(8)*	N/A	3	74	0
IF	2	*(2)*	N/A	2	220	2
ITN	21	*(21)*	N/A	15	193	0
RISE	109	*(109)*	N/A	50	288	374
Total:	**140**	***(140)*****	**N/A**	**70**	**775**	**376**

* Number of Participations is the number of participations by organisations i.e. the total number of times that organisations in this country have participated in each action.
**In brackets - partner organisations (included in the total number).

The diagram below represents the project distribution of H2020-MSCA for Chinese researchers. Just over 5% of the projects are related to life sciences, containing health research.

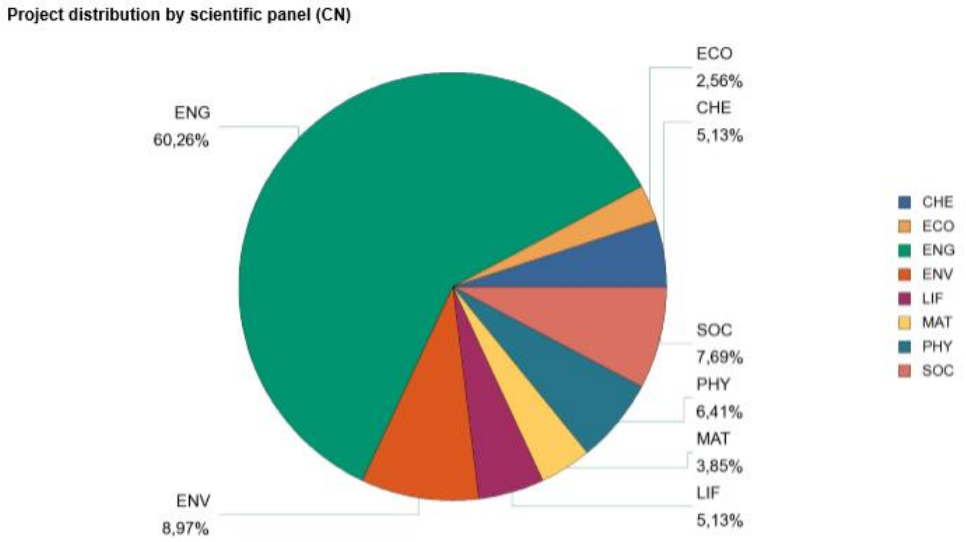


Figure 11: Project distribution of H2020 – MSCA for Chinese researchers

China does not attract many European fellows, as shown in Figure 12. Most of the fellows going to China already have the Chinese nationality but live in another country.

[86] https://ec.europa.eu/research/mariecurieactions/sites/mariecurie2/files/msca-country-profile-china-2018_en.pdf (accessed 09th August 2019)

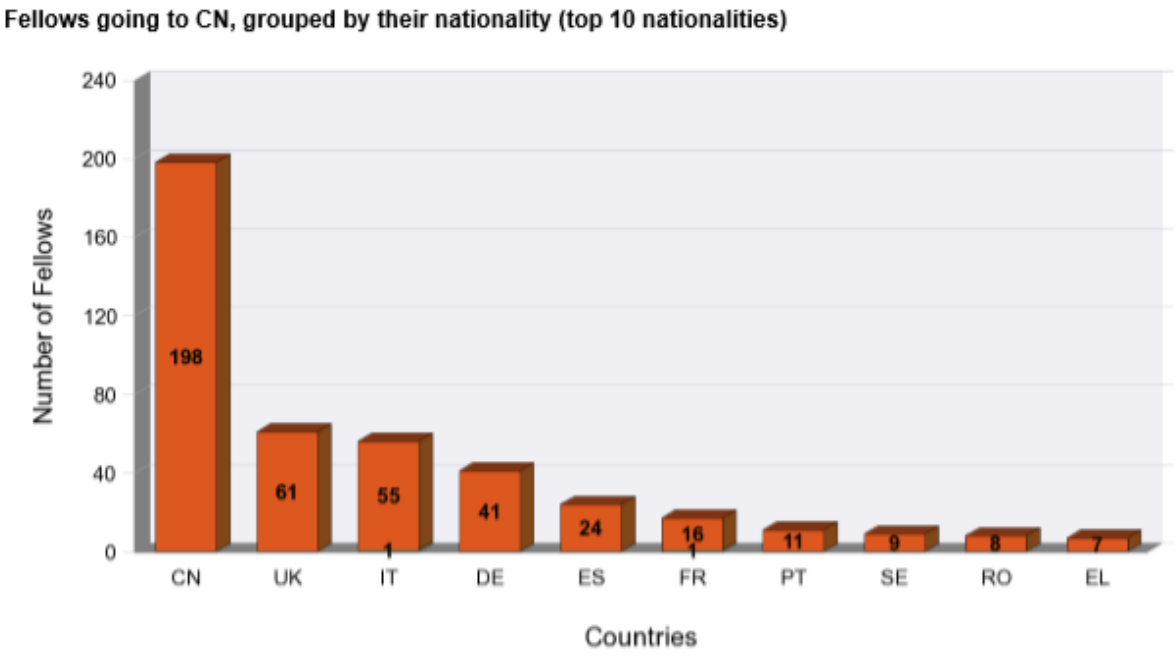


Figure 12: Fellows going to China, grouped by their nationalities – MSCA[86]

Chinese fellows are most interested to work in the UK, Germany and France.

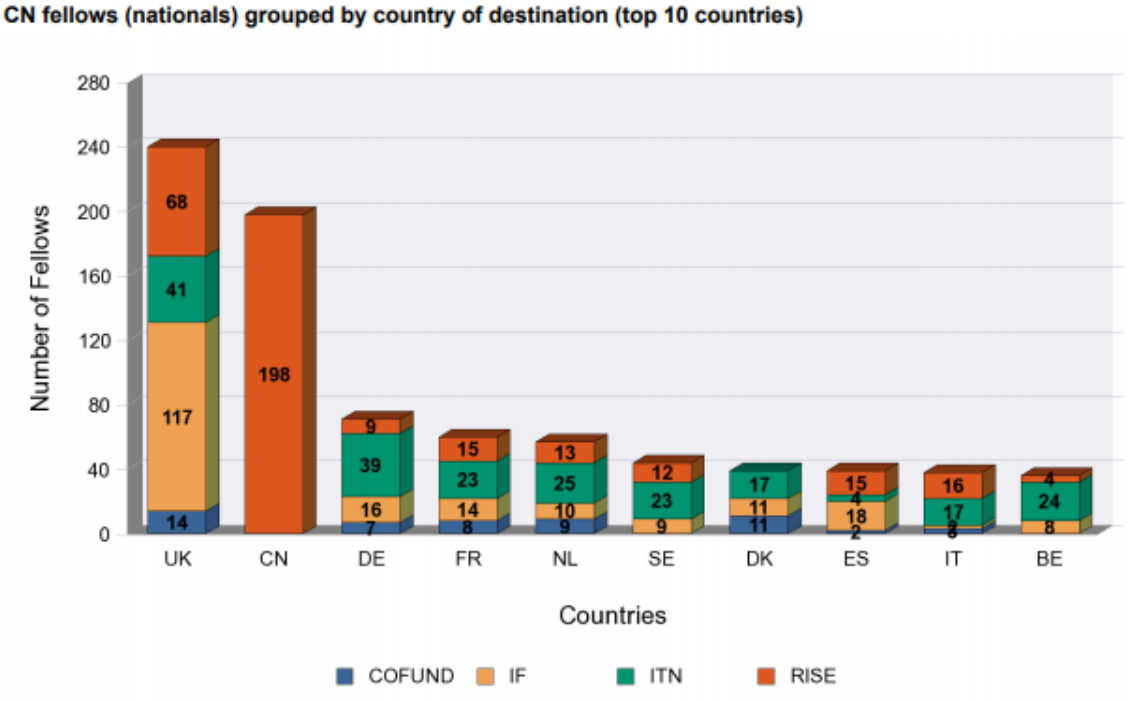


Figure 13: Chinese fellows grouped by country of destination – MSCA[86]

5.1.1.2 Erasmus+

Since 1987, over 9 million European scientists have participated in the **Erasmus+** mobility programme[87]. Almost 4.5 million students in European higher education have gone on a study exchange or work placement in another European country. The programme supports individuals as well as organisations. China is a partner country for the programme.

According to the Erasmus+ programme's "Country fact sheet statistics"[88], 1,191 proposals involving China have been received since 2015 out of which 574 projects have been selected:

- 3,177 students and staff moving to Europe
- 1,973 students and staff moving to China

China is the biggest country in terms of regional budget (Figure 16).

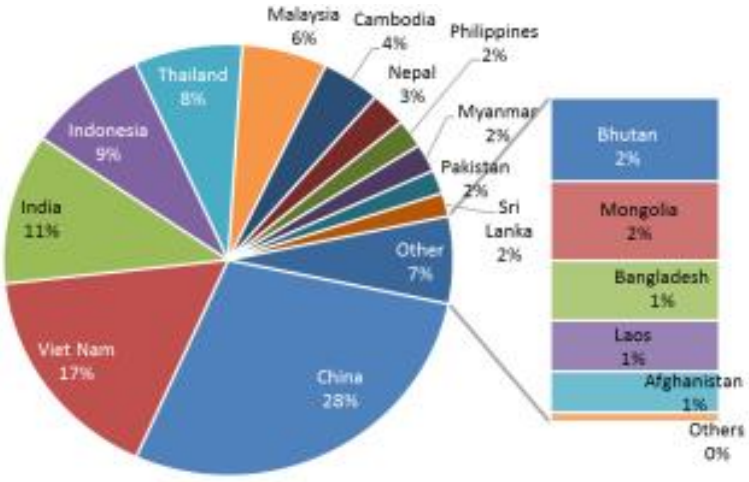


Figure 14: Erasmus+ participation to Asia [88]

5.1.1.3 The European Research Council (ERC)

The **ERC** was set up in 2007 under FP7 (2007-2013). "Through peer reviewed competitions the best researchers are funded to perform their research in Europe" and the ERC aims to help the creation of teams. Between 2014 and 2020, the total budget allocated by the ERC is €13.1 billion (an increase of 60% compared to FP7). The ERC has yearly calls covering all scientific fields and all nationalities can apply. Several types of grants are available:

- **Starting Grant**: Researchers with 2-7 years of experience since completion of PhD;
- **Consolidator Grant:** Researchers (Principal Investigators) with 7-12 years of experience since completion of PhD;
- **Advanced Grants:** Applicants are expected to have a track-record of significant research achievements in the last 10 years;
- Other grants are available, when applicants are already Principal Investigators.

All research must be conducted in a public or private research organisation in the EU MS or Associated Countries and researchers from other regions can apply for additional funding.

The ERC plan for 2020 announces a budget of €2.2 billion and the support for 1,100 top researchers[89]. It represents 17% of the overall H2020 budget.

[87] https://ec.europa.eu/programmes/erasmus-plus/node_en (accessed 08th August 2019)

[88] https://ec.europa.eu/programmes/erasmus-plus/resources/documents/country-factsheet-china_en and https://ec.europa.eu/programmes/erasmus-plus/sites/erasmusplus2/files/erasmusplus_china_2018.pdf (accessed 09th August 2019)

[89] https://erc.europa.eu/news/erc-2020-work-programme (accessed 13th August 2019)

Since 2007, some 9,000 projects have been selected for funding from more than 65,000 applications[90].

Among those projects, the ERC has awarded a total of 27 grants to Chinese Principal Investigators: 8 under FP7 and 19 under H2020. More than 7,000 ERC projects are currently running with approximately 1,300 Chinese team members[91].

5.1.1.4 EURAXESS, a pan-European initiative

EURAXESS [92] is a platform to check for available job positions, but it only works if the institutes/universities post available positions online. Supported by the EU, EU MS and Associated Countries, EURAXESS "supports researcher mobility and career development, while enhancing scientific collaboration between Europe and the world". Researchers can find job offers, funding opportunities and get free assistance when changing countries for work. EURAXESS China specifically links researchers in China with Europe.

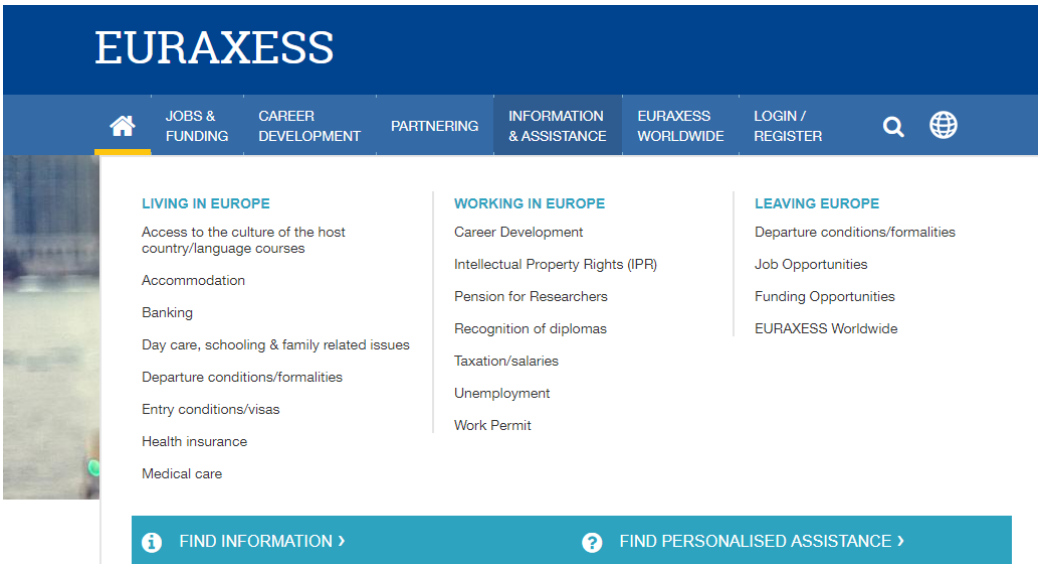


Figure 15: The EURAXESS platform

5.1.2 Researcher mobility at the EU MS level

5.1.2.1 Calls promoting mobility

The mobility of European or foreign researchers is organised through national programmes or specific international calls. They play an important role in the exchange of researchers, as mentioned in the report "Map of major funding agencies and stakeholders in Europe and China". Different schemes of funding calls were identified:

- The majority of calls do not specifically target China, as the call/programmes are widely open to international applicants.
- Other calls/programmes focus on collaboration with organisations from third countries or target-countries including China, as the "Découverte programme Chine 2019" launched in 2018 by the French Ministry of Europe and Foreign Affairs[93].

[90] https://erc.europa.eu/projects-figures/facts-and-figures (accessed 13th August 2019)
[91] https://ec.europa.eu/research/iscp/pdf/policy/cn_roadmap_2017.pdf (accessed 13th August 2019)
[92] https://euraxess.ec.europa.eu/ (accessed 09th August 2019)
[93] https://www.inserm.fr/en/professional-area/appels-projets-et-financements/financements-pour-collaboration-internationale-et-europeenne/funding-programs-with-china (accessed 08th August 2019)

- Considering the topics of the calls or programme, they could be open to health as a whole or specifically dedicated to a unique topic, as proposed by the Research Foundation Flanders (2019 call for expression of interested) "young people with mental health problems"[94].

The calls are promoted and supported by specific agencies such as the German Academic Exchange Service (Deutschen Akademischen Austauschdienst)[95], the German Research Foundation (Deutsche Forschungsgemeinschaft)[96], the Alexander von Humboldt foundation[97], "Campus France"[98] or EURAXESS.

Most of the time, EU MS have no specific office in charge of collecting opportunities for international mobility. The institutes/universities manage the information themselves, so they can hire international researchers through doctoral and postdoctoral positions or an open competition exam.

The involvement and willingness of an institute or a researcher to promote mobility to China is the key aspect for the development of the researcher mobility, together with the provision of associated funds.

5.1.2.2 Joint Centres / International Associated Laboratories for scientific cooperation

The most advanced form of collaboration between a European country and China are the **Joint Research Centres** and the **International Associated Laboratories** depending on the European country's research strategies. They are a system of co-funded research institutes, implemented virtually or physically. These structures are put in place with the objective of developing a research project shared between a national research team and a foreign research team.

Some examples of collaborative centre between an EU MS and China are provided below:

- Sino-German Centre for Research Promotion[99] in Beijing aims to promote scientific cooperation between Germany and China with a focus on the natural sciences, life sciences, engineering sciences and management sciences;
- Sino-Austrian Biomarker Research Center[100] is dedicated to discovering biomarkers in cancer invasion and metastasis;
- Sino-French institute "VirHost"[101] aims to develop collaborative projects regarding interactions between human disease-associated viruses, especially focusing on HIV and identifying new targets for therapeutic intervention.

[94] https://www.fwo.be/en/news/calls/research-project-red-nose-day/ (accessed 08th August 2019)

[95] https://www.daad.de/en/ (accessed 08th August 2019)

[96] https://www.dfg.de/en/index.jsp (accessed 08th August 2019)

[97] https://www.humboldt-foundation.de/web/home.html (accessed 08th August 2019)

[98] https://www.campusfrance.org/en (accessed 08th August 2019)

[99] https://www.dfg.de/en/dfg_profile/head_office/dfg_abroad/beijing/ (accessed 08th August 2019)

[100] http://english.bjmu.edu.cn/academicsresearch/keyinstitutes/62.htm (accessed 08th August 2019)

[101] https://www.institutcochin.fr/institute/news/creation-du-laboratoire-international-associe-lia-virhost?set_language=en (accessed 08th August 2019)

5.1.3 Researcher mobility in China

The programmes identified in the report "Map of major agencies and stakeholders in Europe and China" are from the Chinese national level, such as the Key R&D Programmes, National Natural Science Fund, Major S&T Projects, Technology Innovation Guidance Fund and Bases, and Talents Programme. They cover a wide range of subjects related to health. The calls are annual and offer the opportunity to implement a project lasting from two years to five years[102].

5.2 Current situation of researcher mobility

The 2017 "Survey on researchers outside of Europe" [103] assesses the mobility of researchers outside of the EU. In the survey, PhD mobility (up to three months) and Post-Doctoral mobility (from three months) were examined.

Asia is one of the most active regions for the mobility of researchers towards Europe. European researchers mostly go on mobility for more than a year, whilst Chinese researchers often go on short-term mobility. Considering the EU researchers working abroad participating in the survey, China represents only 4% of the moving outside EU, while Asia represents 23% of the mobility destination (Figure 16).

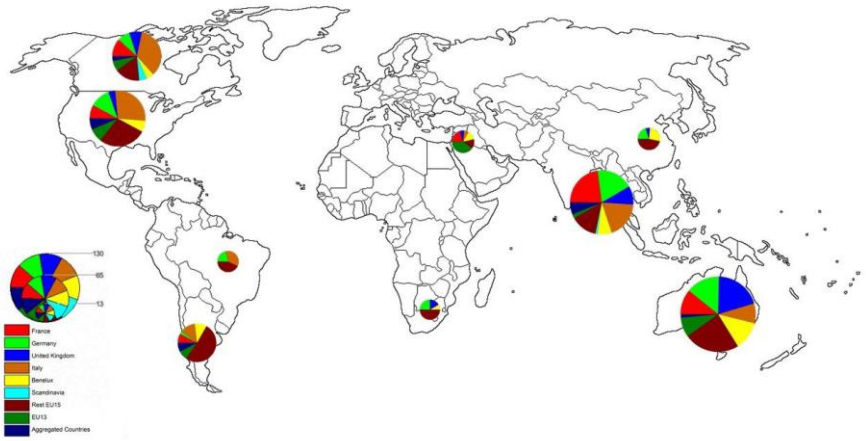


Figure 16: Map of current location of EU researchers abroad[104]

When analysing the mobility flow of non-EU researchers towards EU-destinations, Germany was the most popular destination (15% of the EU moves) followed by France (14%), the UK (13%) and Spain (10%) (Figure 17).

[102] FOURTH AD HOC STUDY European researchers' mobility in China: challenges and opportunities (accessed 08th August 2019)

[103] https://cdn5.euraxess.org/sites/default/files/policy_library/survey_on_researchers_outside_of_europe_0.pdf (accessed 07th August 2019)

[104] MORE3 Global survey (2017) (accessed 07th August 2019)

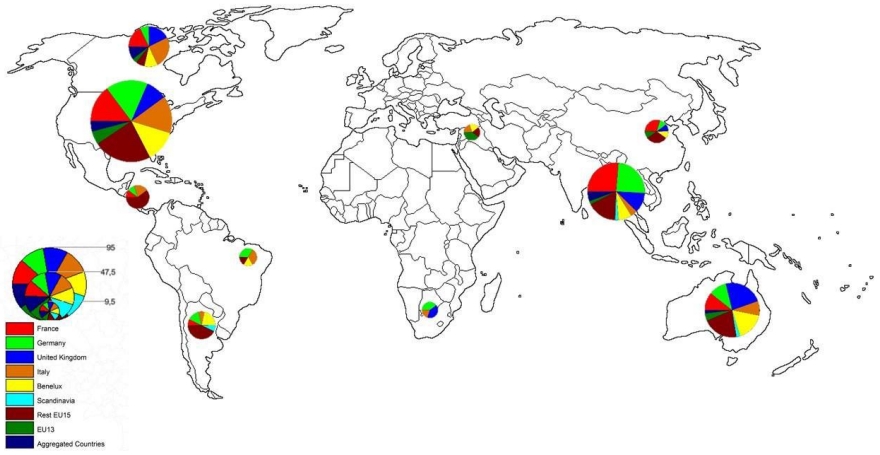


Figure 17: Map of mobility flows from the EU towards non-EU countries[104]

The "UNESCO SCIENCE REPORT, TOWARDS 2030" highlights that China had 58,492 students working abroad with the top destinations being USA, Japan, UK, Australia, France, Republic of Korea, Canada and Sweden[105].

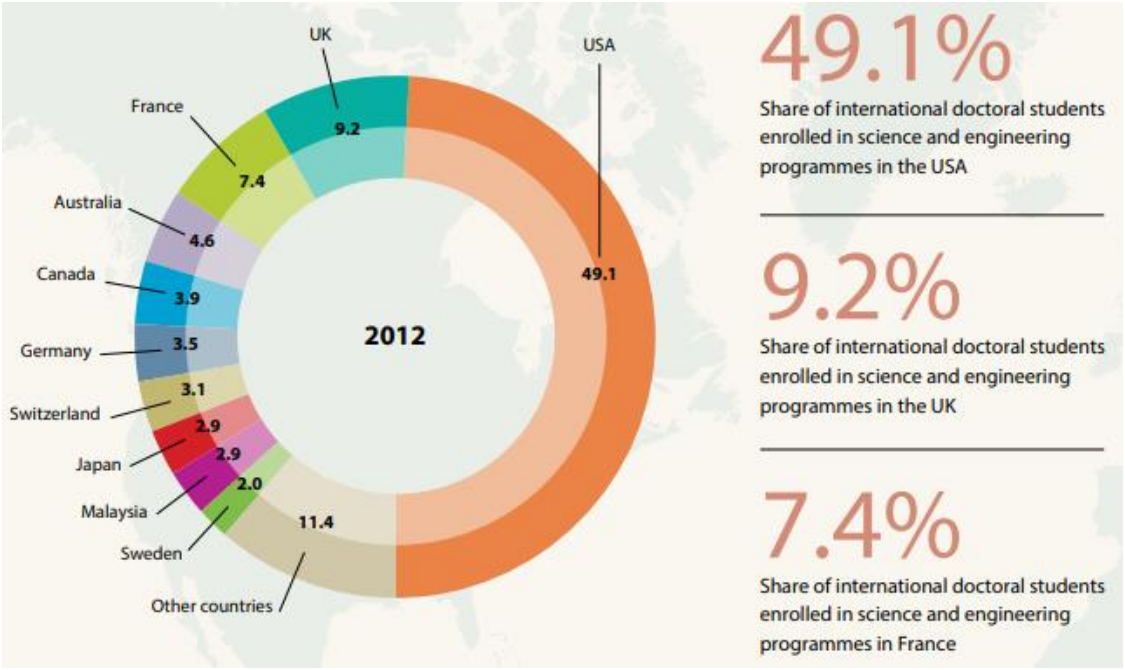


Figure 18: Preferred destinations of international doctoral students in science and engineering fields, 2012[106]

5.2.1 Researchers' global interest in mobility

Approximately half of the survey' participants are interested in mobility programmes with China. Most of them are searching for a funding opportunity/programme but they have never applied. Some of them are currently working in a joint centre in China or had long experience (more than 20 years) in exchange with China.

[105] https://en.unesco.org/sites/default/files/usr_2-12_prefered_destination_students.pdf (accessed 13th August 2019)
[106] UNESCO SCIENCE REPORT, TOWARDS 2030 report

They were asked to specify the programme/funds/calls addressed if they have already started to search for funds, but only two programmes have been clearly identified: (1) Mobility programme of the French "Centre National de la Recherche Scientifique" for French Researchers (2) Thousand Talents Plan.

The survey participants would appreciate the opportunity to apply to generic or specific calls (e.g. biomedical science and reproductive and child health, clinical trials). The programme/calls must allow them **to stay one to five years in Europe or China**. This shows that the calls identified in this report are not suitable for applying and conducting a full research project.

According to the interviewees and the desk research findings, mobility programmes with a duration of three months to one or two years will cover most of the travel cost. In China, for example, European researchers need to apply to the CFMs to fund their research in the country. The application must be translated in Chinese by official administration therefore posing a possible obstacle for applying to mobility programmes.

5.2.2 Main drivers of mobility

It is worth considering the main drivers of mobility which include designing programmes/call answering the drivers in terms of budget, aim and duration.

The researchers are mainly concerned by accessing better funding conditions for their research. Mobility is a good opportunity to gain knowledge and international experience with famous researchers. But they are also aware that going abroad would allow them to share their own knowledge and experience. They mentioned that working in a famous institution would help us to access to better high technological processes /equipment and could improve their technical skills.

What are the main drivers of mobility?
Better funding conditions
Possibility of gaining knowledge, technical skills and international experience
Possibility of sharing knowledge and experience
Working in a famous institution/with famous researchers
Access to better high technological processes /equipment

5.2.3 Main obstacles of mobility

According the 2019 "European researcher mobility in China: challenges and opportunities" report[107], the main difficulties encountered by European researchers in China are the **language and cultural barriers.**

Personal barriers such as the time-consuming process of immigration and difficulty to obtain a **permanent residence permit** were also highlighted. The spouse may not be able to easily obtain a work contract or be able to choose the type of contract (part time vs. full time).

Professional obstacles are also well defined throughout this report. European researchers are not well integrated within the Chinese scientific research community and it is **difficult for them to participate in a decision-making process**. Indeed, they do not have access to top-level funding schemes and prestigious awards (61% of survey participants stated that they have never been beneficiaries of

[107] FOURTH AD HOC STUDY European researchers' mobility in China: challenges and opportunities - https://cdn2.euraxess.org/sites/default/files/4-european-researchers-mobility-in-china-challenges-and-opportunities.pdf page 8 (accessed 09th August 2019)

mobility schemes or incentives in China). Indeed, Chinese talent recruitment programmes only support extended discontinued periods of work, such as up to 6 or 9 months per year over a 3- or 5-year period.

41% of survey participants identify "limited access to data and information" as a major obstacle to research productivity.

Finally, **few Chinese programmes allow applications in English**.

In the survey, the obstacles of mobility were ranked. The list of different obstacles suggested has been developed considering that the researchers could have experienced professional or personal obstacles. The question they had to answer was the following "Which are the main obstacles of mobility i.e. Why would you not apply to a mobility programme?".

Given that there are no participants that have already experimented a mobility programme, it was difficult to clearly identify the obstacles encountered during the mobility programme. Nonetheless, it was mentioned that the programme could be easier if the application process did not have closed deadlines but rather **continuous application possibilities** and was **more family friendly**.

The lack of information is the main issue identified in the survey, following by insufficient skills in the foreign language and lack of motivation.

What are the main obstacles of mobility?

The lack of information provided by home institution is the main researchers concern.

Complex application process

Family issues

5.2.4 Support/services expected by mobility programme applicants

Participants were asked which kind of support/services they expected when applying. These options were proposed, and researchers have had the possibility to select different services covered by the call:

- Easy and comprehensive information on financial help regarding mobility (e.g. what is covered by the grant)
- administrative point of contact in home institution
- Administrative help from home institution
- An administrative point of contact in the host country
- Administrative help from the host country
- Personal disposition supports such family travel/knowledge on job opportunities for family, etc.

All available answers were selected by the participates, meaning that mobility is composed of a multifactor of aspects including personal and administrative.

Support from the home institution as well as the host organisation is needed and support for the close family is appreciated.

What are the services expected by the researchers to work abroad?

Multi-services are expected by the researchers:

- Administrative support at home and host countries
- Administrative point of contact at home and host institution
- Support for the close family
- Easy and comprehensive information on financial help regarding mobility

5.3 Challenges and recommendations on researcher mobility

Of course, mobility programmes could be a good base for collaboration. However, the calls or programmes specifically targeting China are difficult to find and they are not opened annually.

They are diverse in terms of cost, duration and objectives. Sometimes it is difficult to understand at first glance what is covered by the funding and the duration of the programmes. The projects are not always matching with the potential applicant's area of interest.

In Europe, in support to the EU MCSA mobility programmes, it could be interesting to develop, at the EU MS level, more mobility programmes targeting third countries, with a suitable duration for leading experimentation in the host institution.

In China, a major problem faced by Europeans is that they have to apply to the CFM to fund their research. The application needs to be translated to Chinese by official administration. Few calls allow European researchers to apply in English.

Researchers proposed that programmes should be better promoted, the application process facilitated, and the mobility more family friendly.

6 General challenges and areas for collaboration

Despite the political intention to improve collaboration between the EU and China in health research (through agreements and the promotion of collaboration in work programmes), effective cooperation between researchers is not widespread yet.

This is the result of a lack of understanding of the benefits of collaboration, as well as the result of some important challenges that the SENET Expert Groups will have to focus on.

6.1 Benefits of collaboration

The Chinese and European health landscapes are culturally and historically different which makes a great room for a fruitful collaboration.

- **The growing needs of the Chinese population:**

Access to adequate healthcare is crucial to social and economic development, as healthy human capital fosters productivity and economic growth. China has transformed to the world's second-largest economy, but its system cannot support its population of more than one billion people. The major gaps and inequalities in healthcare access threaten to undermine China's progress, social stability and financial health, creating a serious challenge. The Chinese government is working on providing affordable basic healthcare to all residents by 2020 and therefore needs the help of international companies and researchers to provide more and less expensive medicines.

The country has a large number of residents with specific characteristics and needs regarding health:

- An increasing **older population** and the elimination of the one-child policy is expected to increase the demand for healthcare and **institution-based senior care**.
- **Rapid urbanisation** and the increase of the living standards have led to more effective demand for healthcare by migrant workers to cater to the **wealthy's needs**.
- The growing of **mobile health technology** is expected to be popular in **rural areas.** Cross-cutting thematic researchers (e-health etc.) will find an immense testbed in China.

These recent changes in the Chinese healthcare industry and in the type of patients make health collaboration an amazing opportunity for European researchers.

- **Innovation boost with researcher mobility:**

The Chinese National Plan for Medium - and Long-term Education Reform and Development (2010-2020) states that China will "further open education" through "promoting international exchanges and cooperation, introducing quality education resources abroad and upgrading exchanges and cooperation"[108]. China is in fact keen to bridge the quality gap between its universities and top universities overseas.

China also needs to collaborate with top Western universities to boost innovation as it moves from being a manufacturing economy up the value chain.

- **Clinical trials:**

China's potential to recruit a sufficient number of participants to conduct large studies is enormous. Therefore, it stands as one of the regions with the highest growth rate of clinical trials worldwide.

So far, 32 national centres for clinical medicine research have been established in the country, and a collaborative innovation network of more than 2,100 medical institutions in 260 cities has been formed. Clinical trials conducted there also cost half of to those conducted in Europe and North America because of a lower cost base of medical staff[109].

However, the average time delay for an application to register a clinical trial of an innovative drug is 14 months, which is 10 times longer than the United States.

The lack of expertise of certain Chinese clinical researchers, lack of departments and the focus on company needs require more international collaboration to overcome the challenges.

- **Similarity of health priorities and knowledge complementary:**

Chinese laboratories have a good technological platform (e.g. P4 laboratories) and high-performance equipment that could support the improvement of response to serious cross-border health threats caused by dangerous pathogens.

In Europe, there has been a strong development of health technologies and platforms, however, these platforms remain insufficient in terms of finance and population. Therefore, European medical and pharmaceutical companies can find the funding from China in order to carry out original innovation, as the Chinese government is very supportive of such innovation.

6.2 Challenges of collaboration

While collaboration would bring clear benefits to European as well as Chinese researchers, a certain mistrust has been observed, leading to a low rate of concrete cooperation.

The challenges are mainly due to cultural differences; however, measures can easily be implemented to reduce this loss of confidence. The **SENET Expert Groups** will aim to facilitate and strengthen the policy dialogue to develop concrete measures to overcome these existing gaps.

- **Ethics:**

"Ethics are a question of culture, and that is about tradition, especially where it touches on human life[110]".

Ethical standards promote the values that are essential to collaborative work, such as trust, accountability, mutual respect and fairness and are therefore a prominent issue for research collaboration.

[108] https://www.qaa.ac.uk/docs/qaa/international/country-report-china-2017.pdf?sfvrsn=12c9f781_10 (Accessed 26th September 2019)
[109] https://blogs.bmj.com/bmj/2018/10/15/fulfil-chinas-potential-clinical-trials/ (Accessed 26th September 2019)
[110] https://www.nytimes.com/2015/06/30/science/a-scientific-ethical-divide-between-china-and-west.html (accessed 23th September 2019)

China and Europe share different views on ethics and some experts worry that medical researchers in China are stepping over ethical boundaries long accepted in the West (for example, the gene-edited babies' scandal has reduced international trust in science collaboration with China).

Chinese political leaders are now recognising the importance of ethical research to protect the country's global reputation in science and to continue international research collaborations. Thus, research ethics is rising up the political agenda in China. In fact, in late January 2019, the Ministry of Science and Technology and Ministry of Finance published a joint document urging scientists and research institutes to enhance ethics oversight and regulation and establish regulatory committees to ensure ethical practices in research[111].

To restore Western researchers' confidence and boost collaboration, a clear ethics structure within the Chinese institutions themselves and follow-up sanctions for breaking the rules are still needed.

- Data protection[112]:

Sharing data with research partners is a pledge of trust and a sign of mutual confidence and respect. It is essential that securing patient data properly shall be at the heart of collaboration and innovation efforts.

The GDPR which came into force in May 2018, sets strict rules for the use of personal data including all areas of academic and scientific research, and encompasses the transfer of data outside the EU, including China. Art. 44 GDPR states that "Any transfer of personal data which are undergoing processing or are intended for processing after transfer to a third country or to an international organisation shall take place only if, subject to the other provisions of this Regulation, the conditions laid down in this Chapter are complied with by the controller and processor, including for onward transfers of personal data from the third country or an international organisation to another third country or to another international organisation. All provisions in this Chapter shall be applied in order to ensure that the level of protection of natural persons guaranteed by this Regulation is not undermined." This statement means that the exchange of data, between two organisations, within the EU or at the international level, requires a high level of personal data protection with the application of GDPR.

A right to the protection of privacy is contained in Chinese regulations but is generally seen as not justiciable[113]. Research cooperation might therefore be hampered.

More particularly, some Chinese public bodies are excluded from the scope of China's own regulations. There is also no independent supervisory authority, and all data must be submitted to Chinese government data centres.

However, China already began its legislative process towards the protection of personal information. In March 2018, the TC260 (the National Information Security Standardisation Technical Committee) which is jointly administered by the Cyberspace Administration of China and the Standardization Administration of China, issued the "Information Security Technology – Personal Information Security Specifications" a standard which covers the collection, storage, use, sharing, transfer and disclosure of personal information, considered similar to the GDPR expect that these specifications are guidelines and no regulation[114] [115].

In adopting the GDPR and a strict protection of data, the EC made it more difficult for researchers to collaborate with scientists from third countries.

[111] https://www.universityworldnews.com/post.php?story=20190307200925304 (accessed 23th September 2019)
[112] https://link.springer.com/article/10.1007/s10734-019-00377-5 (accessed 23th September 2019)
[113] https://technode.com/2019/06/19/china-data-protections-law/ (accessed 23th September 2019)
[114] http://www.hk-lawyer.org/content/national-information-security-standardization-technical-committee-tc-260-issues-national (accessed 23th September 2019)
[115] https://technode.com/2019/06/19/china-data-protections-law/ (accessed 23th September 2019)

However, the aim is to upgrade the data protection globally, encouraging China and other countries to adopt stricter rules and laws in compliance with the European regulation.

- Chinese bureaucracy:

Public-private partnerships to improve drug development still remains relatively nascent in China due to excessive government restrictions on foreign entities, capacity and innovation challenges for local, government-funded researchers, and overall administrative policy failure behind unsuccessful efforts to incentivise new drug development.

As highlighted before in this report, a number of constraints exist for researchers who want to work with China (regarding visa and application to calls procedures, language barrier, etc.).

A simplification of the all the procedures related to health research would be a big step forward to more collaboration.

7 Conclusion

This strategy paper aims to propose a stakeholder vision and recommendation on how collaboration between Europe and China in the health sector can be improved. Although the knowledge base (number of contributing stakeholders to the survey and the interviews) was limited, it was complemented by extensive desk research and the findings provide directions for further discussions.

This strategy paper also aims to prepare the SENET Expert Groups meetings, which will help to reflect in more depth on which future health priorities must be tackled between the EU and China. The SENET Expert Groups will build a sustainable network between the EU and China to support a continuous dialogue and facilitation of identification of relevant topics in health R&I. The Expert Groups aim to deepen the policy dialogue. The groups are also dedicated to validating the recommendations gathered in this report and verify the feasibility of their implementation into programmes.

Regarding the desk research, survey and the interviews, the topics were broad: European and Chinese health priorities, researcher mobility, barriers and opportunities, future challenges and recommendations. In fact, collaboration is not only built on projects but also on regular exchange which could be supported by the mobility of researchers and more bilateral initiatives.

As demonstrated in this paper, global health priorities – infectious diseases, chronic diseases and vaccines – are considered as priorities by several participants. New trends in health could support collaboration between the EU and China on such diseases.

Future dialogue between the EU and China is expected. To improve collaboration, regulations on the use of new technologies and on clinical trials, ethical questions and data sharing needs to be harmonised.

8 Annexes

8.1 Survey

FIRST PAGE OF SURVEY

This project has received funding by the European Union's Horizon 2020 research and innovation programme (Grant Agreement No 825904)

该项目已获欧盟"地平线 2020"研究及创新计划资助(项目编号:825904)

Thank you for your interest in taking our SENET Project Survey
谢谢您参与 SENET 项目的问卷调查

The Sino-European Health Networking Hub – SENET – was launched in January 2019 and aims at creating a sustainable health networking and knowledge hub between Europe and China. Cooperation efforts focused on common health challenges will facilitate favourable conditions for a continuous and sustainable dialogue between China and the EU.
中欧医疗健康网络中心 - SENET--于 2019 年 1 月正式启动，旨在为中欧两国建立一个可持续的健康网络和知识中心。以共同卫生挑战为合作重点，为中欧之间持续和可持续的对话提供有利条件。

Within this context, this survey aims to assess:

- the health research and innovation priorities in the EU and China;
- 中欧卫生研究和创新优先领域;
- the mobility of European and Chinese health researchers;
- 中欧卫生研究人员的流动性;
- current EU-China health research and innovation collaborative projects;
- 目前的中欧卫生研究与创新合作项目;
- the participation of Chinese health researchers and innovation stakeholders in Horizon 2020 and European health researchers and innovation stakeholders in Chinese funding programmes.
- 中国卫生研究人员和创新利益攸关方参与地平线 2020，欧洲卫生研究人员和创新利益攸关方参与中国资助项目。

The opinions gathered will help us to develop a strategy paper that supports closer EU-China health research and innovation collaboration.
您的意见将有助于我们制定一份战略计划，该计划将使中欧卫生研究和创新合作更加紧密。

This survey is **anonymous** and will take about **10 minutes** to complete. 这是匿名的问卷调查，需要 10 分钟完成。

START 开始

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1. Stakeholder information

1.1. Gender

- □ Male
- □ Female
- □ Other (Non-binary)

性别

- □ 男
- □ 女
- □ 其他

1.2. Age group

- □ < 25 years old
- □ 26 - 40 years old
- □ 41 – 60 years old
- □ > 60 years old

年龄

- □ 小于 25 岁
- □ 26 到 40 岁之间
- □ 40 到 60 岁之间
- □ 超过 60 岁

1.3. Country 国籍: _____

1.4. Which type of organisation do you represent?

- □ Academic research
- □ Business association
- □ SMEs
- □ Industry groups
- □ Public authority
- □ Non-governmental
- □ Consultancy
- □ Other organisations (please specify)

请问您从事哪个行业 ？

- □ 学术研究
- □ 商业协会
- □ 中小企业
- □ 行业团体

- □ 政府机构
- □ 非政府机构
- □ 咨询
- □ 其他行业 (请说明)

1.5. Position 职位:

2. Assessment of EU-China health research and innovation priorities

评估中欧卫生研究和创新重点

2.1. What are your research/innovation topics of interest within health? Please identify a maximum of 3 topics.

请问您对卫生领域感兴趣的研究/创新主题是什么?请列出 3 个主题

2.2. What do you think should be the health priority topics for EU/China researchers? Please identify a maximum of 3 priority topics.

您认为欧盟/中国的研究人员应该优先关注哪些健康领域的问题?请列出最多 3 个优先主题。

2.3. Why do you think these fields are a priority?

为什么您认为这些领域是优先考虑的?

2.4. The latest Horizon 2020 Health Work Programme (2018-2020) establishes a set of priorities within the topic. For each priority, please select according to the most relevant to you: Please drag the options from the left column and drop it to the right column in the priority order.

最新的地平线 2020 健康工作计划(2018-2020)在该主题内确立了一系列优先事项。对于每个优先级，请根据您的实际情况打分：

Please use the scale from 1 to 7	*1*	*2*	*3*	*4*	*5*	*6*	*7*
	Not Relevant						*Very Relevant*

Personalised medicine	☐	☐	☐	☐	☐	☐	☐
Innovative health and care industry	☐	☐	☐	☐	☐	☐	☐
Infectious diseases and improving global health	☐	☐	☐	☐	☐	☐	☐
Innovative healthcare system - Integration of care	☐	☐	☐	☐	☐	☐	☐
Decoding the role of the environment, including climate change, for health and wellbeing	☐	☐	☐	☐	☐	☐	☐
Enable better access to healthcare for patients	☐	☐	☐	☐	☐	☐	☐
Ensure the sustainability of health and care systems	☐	☐	☐	☐	☐	☐	☐
1-7 分	*1*	*2*	*3*	*4*	*5*	*6*	*7*
	不相关						*非常相关*
个性化医疗	☐	☐	☐	☐	☐	☐	☐
新型健康和护理行业	☐	☐	☐	☐	☐	☐	☐
传染病和改善全球健康水平	☐	☐	☐	☐	☐	☐	☐
创新的医疗保健系统 - 整合护理	☐	☐	☐	☐	☐	☐	☐
解释环境（包括气候变化）对健康和福祉的影响	☐	☐	☐	☐	☐	☐	☐
为患者提供更好的医疗保健服务	☐	☐	☐	☐	☐	☐	☐
确保健康和护理系统的可持续性	☐	☐	☐	☐	☐	☐	☐

2.5. The State Council of the People's Republic of China establishes a set of priorities within the topic. For each priority, please select according to the most relevant to you: Please use the scale from 1 to 7

中华民国国务院在该专题中确定了一系列优先事项。 对于每个优先级，请根据您最相关的选择：

Please use the scale from 1 to 7	*1*	*2*	*3*	*4*	*5*	*6*	*7*
	Not Relevant						*Very Relevant*
Prevention and treatment of major infectious diseases	☐	☐	☐	☐	☐	☐	☐
New Drugs Development for major disease	☐	☐	☐	☐	☐	☐	☐
Prevention and control of chronic diseases	☐	☐	☐	☐	☐	☐	☐
Improving Traditional Chinese Medicine (TCM)	☐	☐	☐	☐	☐	☐	☐
Delivery of high quality and efficient medical care	☐	☐	☐	☐	☐	☐	☐
Promoting science and technology innovation in health care	☐	☐	☐	☐	☐	☐	☐

Other: _____	☐	☐	☐	☐	☐	☐	☐

1 到 7 分	*1*	*2*	*3*	*4*	*5*	*6*	*7*
	不相关						*非常相关*
预防和治疗重大传染病	☐	☐	☐	☐	☐	☐	☐
针对重大疾病的新药开发	☐	☐	☐	☐	☐	☐	☐
预防和控制慢性病	☐	☐	☐	☐	☐	☐	☐
提升中医药研究（TCM）	☐	☐	☐	☐	☐	☐	☐
提供优质高效的医疗服务	☐	☐	☐	☐	☐	☐	☐
促进医疗保健领域的科技创新	☐	☐	☐	☐	☐	☐	☐
其它: _____	☐	☐	☐	☐	☐	☐	☐

3. Assessment of EU-China health researchers' mobility

评估中欧卫生研究人员的流动性

3.1. Are you interested in mobility programmes?

- ☐ Yes
- ☐ No

您对中欧交流计划是否感兴趣?

- ☐ 是的
- ☐ 不感兴趣

[Note: If answered "No" to the previous question please go directly to questions 3.9and following]

[注意：如果对此问题的答案是"不感兴趣"，请直接跳到问题 3.9 及以下几道题]

3.2 (ONLY IF "YES" ON 3.1) If yes, have you already applied for a mobility programme and are you a beneficiary?

- ☐ Yes, I was a beneficiary who has completed the programme and have since moved back to my home country
- ☐ Yes, the programme is still ongoing
- ☐ Yes, and I will continue my career in this country
- ☐ No, but I am searching for a funding opportunity/programme to begin a mobility process
  - ○ please specify how long you intend to be working in the EU (for Chinese) or China (for Europeans)

(如果问题 3.1，您的答案是"是的") 您已经申请交流项目了吗？您从中获益了吗？

- ☐ 是的，我已经交流完回国，并且从中获益颇丰
- ☐ 是的，我正在中/欧交流

- □ 是的，我将继续留在这个国家工作
- □ 还没，我正在寻找资助机会/计划
  - 请说明您打算在欧盟或中国工作多长时间

3.3. (ONLY IF "YES" ON 3.1) If yes, or if you are thinking about applying for a mobility programme:

- □ Please specify the programme/funds/call addressed: ……
- □ Please specify how long you have worked/will work in the EU (for Chinese) or China (for Europeans) …….

（如果问题 3.1，您的答案是 "是的"）请说明您正在考虑申请的研究人员流动计划：

- □ 请说明所涉及的计划/资金/项目：……
- □ 请说明您在欧盟或中国的工作内容/工作的时间…….

3.4. (ONLY IF "YES" ON 3.1) Which kind of support/service would/did you expect when applying?

- □ Easy and comprehensive information on financial help regarding mobility e.g. what is covered by the grant
- □ An administrative point of contact in your home institution
- □ Administrative help from my home institution
- □ An administrative point of contact in the country I am applying to
- □ Administrative help from the country I am applying to
- □ Personal disposition support (family travel/knowledge on job opportunities for family, criteria to work…)

(如果问题 3.1，您的答案是 "是的") 请问申请时您会期望获得哪种支持/服务？

- □ 交流过程中，关于财务帮助的简单而全面的资助信息，例如 资助款项所涵盖的内容
- □ 您所在机构的行政联络点
- □ 来自我所在机构的行政帮助
- □ 我所申请国家的行政联络点
- □ 来自我申请的国家的行政方面的帮助
- □ 工作外的支持（家庭旅行/提供家人工作的机会的信息，工作标准……）

3.5. (ONLY IF "YES" ON 3.1) Which are your main drivers for mobility?

- □ Career development will be improved when I return back home
- □ Possibility to gain international experience
- □ Continue the research topic under better funding conditions
- □ Working in a famous institution/with famous researchers
- □ Access to better high technological processes /equipment / improvement of technical skills
- □ Possibility of gaining knowledge and experience in my field
- □ Possibility of sharing knowledge and experience in my field
- □ Personal interest in the country (follow/join family…)
- □ Possibility to join a private R&I or Industry Research Centre

(如果问题 3.1，您的答案是 “是的”) Which are your main drivers for mobility

请问是什么原因促使您希望去中国/欧洲做交流?

- □ 当我回到本国时，职业发展将得到改善
- □ 获得国际交流的机会
- □ 在更好的资助条件下继续研究课题
- □ 在知名机构/和与知名研究人员工作
- □ 获得更好的高技术工艺/设备/提高技术技能
- □ 在我所熟识的领域获得知识和经验的可能性
- □ 在我所熟识的领域分享知识和经验的可能性
- □ 个人对该国的兴趣（日常关注/加入当地的住宿家庭……）
- □ 可以加入私人 R&I 或行业研究中心

3.6. (ONLY IF “YES” ON 3.2) Which are the main obstacles you have encountered during the mobility programme?

（如果问题 3.2，您的答案是 “是的”）请问在交流机会中所面临的主要障碍是什么？

- □ I did not face any problems
- □ Family matters
- □ Lack of recognition in my department
- □ No skill improvement
- □ Language problems
- □ Insufficient funds
- □ Poor quality of the training
- □ Complicated procedures at my host organisation
- □ Complicated procedures at my home organisation
- □ 我没有遇到任何问题
- □ 家庭因素
- □ 对所处部门缺乏了解
- □ 技能没有得到提升
- □ 语言问题
- □ 资金不足
- □ 培训的效果不好
- □ 主办机构的复杂申请流程
- □ 所在机构的复杂申请流程

3.7. (ONLY IF “YES” ON 3.2) What was the added value for your organisation’s research activities?

- □ National/international conferences/meetings
- □ National/international financial support
- □ Enhanced technology know how
- □ Enhanced knowledge exchange
- □ Number of papers published
- □ Experience abroad

- □ Other (please specify……)

(如果问题 3.2，您的答案是 “是的”)请问您所在的机构的研究活动的附加价值是什么？

- □ 国家/国际会议/会议
- □ 国家/国际财政支持
- □ 增强技术懂得如何去做
- □ 加强知识交流
- □ 发表论文数
- □ 在国外的经验
- □ 其他(请注明……)

3.8. (ONLY IF “YES” ON 3.1) What are your recommendations for programme owner/manager* to improve EU/CN researchers’ participation in mobility programmes?

**Programme “owner” are typically ministries or regional authorities defining research programmes) or programme “manager” (such as research councils or other research funding agencies managing research programmes).*

(如果问题 3.1，您的答案是 “是的”)请问您对项目所有人/经理*有何建议，以改善欧盟/中国研究人员参与流动课程?

前文提到的“所有人”通常是界定研究方案的各部或区域当局)或方案“管理人”(例如研究理事会或管理研究方案的其他研究资助机构)。

3.9. Which are the main obstacles to mobility i.e. Why would you not apply to a mobility programme?

- □ Lack of information provided by my home institution about mobility programmes
- □ Separation from family/ difficulty to bring family with me
- □ Loss of paid job
- □ Lack of support from employer
- □ Lack of motivation
- □ Big competition
- □ Insufficient skills in foreign language
- □ Limited admittance to mobility programmes (age/diploma)
- □ Problems with recognition of results achieved abroad
- □ Other (Please specify…)

交流过程中的主要障碍是什么，比如你为什么不申请流动计划?

- □ 我所在的机构缺乏交流的具体信息
- □ 与家人分离/很难带上家人一起在异国生活
- □ 失去现有的工作
- □ 缺乏雇主的支持
- □ 缺乏动力
- □ 竞争激烈

- □ 外语能力不足
- □ 申请交流的名额有限(对年龄/文凭有要求)
- □ 在国外取得的成果的认可存在一定问题
- □ 其他（请说明）

4. Assessment of the participation in H2020 and Chinese programmes

评估中欧卫生研究人员参与欧盟地平线 2020 计划和中国研究项目

4.1. Are you

An applicant to H2020 or Chinese or Co-funding mechanism programmes (researchers, SMEs/industries)
A NCPs or EEN members or a programme "owner" (typically ministries or regional authorities defining research programmes) or programme "manager" (such as research councils or other research funding agencies managing research programmes)

请问您是:

- □ H2020 或中国或联合资助机制项目的申请人(研究员、中小企业/行业)
- 国家联络点(NCP)或欧洲企业网络(EEN)成员或是项目"所有者"(通常是定义研究项目的部委或区域当局)或项目"管理者"(如研究理事会或管理研究项目的其他研究资助机构)。

4.2. Are you interested in EU-China health research and innovation collaborative projects?

- □ Yes
- □ No

您对去他国交流是否感兴趣?

- □ 是的
- □ 不感兴趣

[Note: If your answer in the previous question was "No" please move forward to 4.7]
[注意:如果对此问题的答案是"不感兴趣",请直接跳到问题 4.7 及以下几道题]

4.3. (ONLY IF "YES" ON 4.2) If yes, have you already worked as part of an EU-China collaborative project?

- □ Yes, and the project has ended
- □ Yes, and the project is still running
- □ No, but I am searching for a collaboration opportunity
  - ○ Please specify your area of interest……..

(如果问题 4.2,您的答案是"是的")您已经申请交流项目了吗?您从中获益了吗?

- □ 是的,这个项目已经结束了
- □ 是的,这个项目旨在进行中
- □ 还没,我正在寻找资助机会/计划

- 请说明您打算在欧盟或中国工作多长时间

4.4. (ONLY IF "YES" ON 4.2) What is/was your motivation to apply for an EU-China collaborative project?

- □ To access specific scientific expertise in my discipline
- □ To access specific expertise from another discipline necessary to go further with my research and innovation topic
- □ My country has no funds available on my research field
- □ To develop new field of research in my organisation
- □ To reinforce my team in a new project
- □ To extend my network
- □ To access fund

(如果问题 4.2，您的答案是 "是的")请问您申请中欧合作项目的出发点是什么？

- □ 获得专业领域的特定科学知识
- □ 获取其他学科的特定专业知识，以推进我的研究和创新课题
- □ 我的国家没有资金用于我的研究领域
- □ 在我的公司发展新的研究领域
- □ 在新项目中加强我的团队
- □ 拓展我的人脉
- □ 获取资金

[Note: If answered "No" to question 4.3 please move forward to 4.6]

[注意: 如果问题 4.3，您的答案是 "还没")，请直接跳到 4.6]

4.5. **(ONLY IF "YES" ON 4.2) What are the main positive points you could share to motivate people to join a collaborative project?**

- □ Good source of funding
- □ International partnerships
- □ Increased international visibility
- □ Interdisciplinary activities
- □ Enlarged network
- □ Others (please specify…)

(如果问题 4.2，您的答案是 "是的")请问您你可以分享哪些积极的观点来激励人们加入一个合作项目？

- □ 资金来源良好
- □ 增进国际伙伴关系
- □ 提高国际知名度
- □ 跨学科活动
- □ 扩大人脉网络
- □ 其他(请注明……)

4.6. (ONLY IF "YES" ON 4.2) What were the main difficulties you had to face during a collaborative project? (如果问题 4.2，您的答案是 "是的") 请问您在合作项目中遇到的主要困难是什么？

- □ I did not face any problems
- □ Lack of recognition in my department
- □ No skill improvement
- □ Language problems
- □ Insufficient funds
- □ Poor quality of the training
- □ Complicated procedures at my host organisation
- □ Complicated procedures at my home organisation
- □ 我没有遇到任何问题
- □ 对所处部门缺乏了解
- □ 技能没有得到提升
- □ 语言问题
- □ 资金不足
- □ 培训的效果不好
- □ 主办机构的复杂申请流程
- □ 所在机构的复杂申请流程

4.7. As researchers, are you interested in participating in a Horizon 2020 or Chinese health related funding programmes?

- □ Yes
- □ No

作为研究员，您是否有兴趣参与地平线 2020 或中国与卫生相关资助项目？

- □ 是的
- □ 不感兴趣

[Note: If answered "No" in question 4.7, please move forward to question 4.12]

[注意: 如果问题 4.7，您的答案是"不感兴趣"，请直接跳到第 4.12 题]

4.8. (ONLY IF "YES" TO 4.7) If yes, have you already applied for Horizon 2020 or Chinese funding programmes?

- □ Yes
- □ No

(如果问题 4.7，您的答案是 "是的")请问您是否已申请"地平线 2020"或中国资助计划?

- □ 是的
- □ 不

4.9. **(ONLY IF "YES" TO 4.7) If you have for applied or are interested in participating in Horizon 2020 or Chinese funding programmes, what are the main reasons that have led you to that? And which are the benefits you expect from these programmes.**

- □ Having access to funding that otherwise would inaccessible
- □ Being able to work with experts from other countries and other fields of knowledge
- □ To be part of a project that otherwise would not be accessible
- □ Having access to better infrastructures and better work conditions
- □ Being able to share knowledge and learn from other experts
- □ Other (please specify)

(如果问题 4.7，您的答案是 “是的”)如果你已经申请或有兴趣参加“地平线 2020”或中国的资助项目，请问您的主要原因是什么?你希望从这些项目中得到什么好处。

- □ 能够获得原本无法获得的资金
- □ 能够与来自其他国家和其他领域的专家一起工作
- □ 成为一个项目的一份子
- □ 拥有更好的基础设施和工作条件
- □ 能够与他人分享知识并向他人学习
- □ 其他(请注明)

4.10. **(ONLY IF “YES” TO 4.7) If you have already participated in a health-related programme from H2020 or Chinese funding, what were the benefits for your institution/industry?**

(如果问题 4.7，您的答案是 “是的”)如果您已经加入地平线 2020 与健康相关项目或中国的资助项目，这对您所处的 的机构/行业有什么好处?

4.11. **(ONLY IF “YES” TO 4.7) If you have already participated in a Horizon 2020 or Chinese funding program, what were the main difficulties/problems you have encountered?**

- □ I did not face any problems
- □ Lack of recognition in my department
- □ No skill improvement
- □ Language problems
- □ Insufficient funds
- □ Poor quality of training
- □ Complicated procedures at my host organisation
- □ Complicated procedures at my home organisation

(如果问题 4.7，您的答案是 “是的”)如果你已经参加了“地平线 2020”或中国资助计划，你遇到的主要困难/问题是什么?

- □ 我没有遇到任何问题
- □ 缺乏工作/研究部门的认可
- □ 技能没有提高
- □ 语言问题
- □ 资金不足
- □ 培训质量差
- □ 主办机构的复杂申请流程
- □ 所在机构的复杂申请流程

4.12. What are the main reasons why you are not participating in an EU Horizon 2020 or Chinese programme?

- □ Lack of awareness of the EU research and innovation framework programmes e.g. Horizon 2020
- □ Lack of awareness of the Chinese research and innovation framework programmes
- □ Preference to participate in other national or regional programmes
- □ Success rates are too low to be worth applying
- □ Difficulties to find project partners
- □ Lack of a relevant area/topic for my needs
- □ Lack of an adequate type of financial support needed for my work
- □ Concerns about sharing valuable knowledge with partners
- □ Limited financial/human resources to prepare a proposal
- □ Language barriers

您没有参加欧盟 2020 计划或中国项目的主要原因是什么？

- □ 缺乏对欧盟研究和创新框架项目的认识，例如地平线 2020
- □ 对中国的研究和创新框架项目缺乏认识
- □ 优先参加其他国家或地区项目
- □ 成功率太低，不值得申请
- □ 项目合作伙伴难寻
- □ 缺乏适合自己的需求的相关领域/话题
- □ 我的工作缺乏足够的资金支持
- □ 顾虑到与合作伙伴分享有价值的知识
- □ 有限的财务/人力资源准备方案
- □ 语言障碍

4.13. (ONLY FOR CHINESE RESEARCHERS) Have you ever applied for EU-China Co-Funding Mechanism (CFM)?

(本问题，仅适用于中国研究人员) 您是否申请过中欧共同资助机制（CFM）？

- □ Yes
- □ No
- □ 是的
- □ 没有

4.14. (ONLY IF "YES" TO 4.13) Please specify the topics that you have applied for.

(如果问题 4.13，您的答案是 "是的")请注明你所申请的主题

4.15. (ONLY IF "YES" TO 4.13) What are the main challenges you have when applying to the CFM?

(如果问题 4.13，您的答案是 “是的”)请问申请 CFM 的主要挑战是什么？

- □ Lack of awareness of the Co-funding mechanism
- □ Difficulties to find project partners
- □ Lack of a relevant area/topic for my needs
- □ Lack of an adequate type of financial support needed for my work
- □ Concerns about sharing valuable knowledge with partners
- □ Limited financial/human resources to prepare a proposal
- □ Other
- □ 缺乏对中欧科研创新联合资助机制的认识
- □ 项目合作伙伴难寻
- □ 缺乏适合自己的需求的相关领域/话题
- □ 我的工作缺乏足够的资金支持
- □ 顾虑到与合作伙伴分享有价值的知识
- □ 有限的财务/人力资源准备方案
  - ○ **其他（请注明…）**

4.16. (ONLY IF “YES” TO 4.13) What are the key recommendations for researchers applying for CFM?

(如果问题 4.13，您的答案是 “是的”) 您对想要申请 CFM 的研究人员的建议是什么？

4.17. In which country are you working?

请问您目前在那个国家工作？

4.18. (ONLY for Chinese participants) What is the number of applications of co-funding in 2018?

(本问题仅限中方回答)请问 2018 年共有多少人申请联合资助?

4.19. According to you experience, what are the main obstacles for EU applicants to participate in H2020 health related projects with China or for Chinese applicants to Co-funding mechanisms?

根据您的经验，欧盟申请人与中国共同参与 H2020 卫生相关项目或中国申请人共同资助机制的主要障碍是什么？

4.20. What are the opportunities in Horizon Europe or future Chinese/programmes to enhance collaboration between EU and China in the field of Health?

在“地平线欧洲”或未来的中国/中国项目中，有哪些机会加强欧盟和中国在卫生领域的合作?

4.21. What are the future priorities in Horizon Europe **or future Chinese/programmes that could enhance collaboration between EU and China in the field of Health?**

在 Horizon Europe 框架计划或未来的中国资金项目中，有哪些可以加强欧盟和中国在卫生领域的合作?

In order to validate the findings of this survey and to learn more about the situation regarding health research and innovation in the EU and China, we would like to interview you on this topic.
为了验证本调查的结果，并了解有关欧盟和中国卫生研究和创新情况的更多信息，我们希望就此主题采访您。

If you are willing to participate in such an interview, please contact SENETHub@steinbeis-europa.de and we will get back to you with further information.
如果您愿意参加此类面试，请联系 SENETHub@steinbeis-europa.de，我们会尽快给您回复。

Thank you very much for thanking the time to complete this survey!
非常感谢您抽出时间完成此调查！

8.2 Interview guidelines

SENET WP1 – Interview Guideline – NCP/ helpdesk

Note to SENET partners: We kindly ask you to return 1 filled-up form/interview - Thank you! Please make sure to integrate in the sections "**Summary of the interview" a clean text that can be copied into the public deliverable. The field "notes" is for your own notes or additional comments you wish to share.**

If possible, in case of several NCP/Helpdesk and/or several researchers interviews, could you prepare a synthesis (major points) for the whole interviews of NCP or Researchers?

Note to SENET partners: **some questions are dedicated to EU or Chinese "NCP", so it is possible they don't have the knowledge from the counterpart's mechanism or programme.**

General information

Interviewing SENET partner	
Interview No.	
Type	☐ Researchers ☐ NCP/Helpdesk
Consent form	☐ Received and signed

Priorities and challenges

- What do you see as the biggest priorities in health research and innovation topics in China and/or Europe right now?

Summary of the interview	**Notes**

- We are planning knowledge & information exchange between health experts from the EU and China. Which are the main administrative and/or scientific/technic topics would you suggest tackling in joint discussions?

Summary of the interview	**Notes**

Funds (co-funding for Chinese researchers) and H2020 programmes /Horizon Europe

- **EU Experts:** According to your experience, do you think the H2020 priorities meet the actual health research priorities in Europe, Why/Why not?
- **OR Chinese Experts:** According to your experience, do you think the Chinese co-funding priorities meet the actual health research priorities in China? Why/Why not?

Summary of the interview	**Notes**

- **EU Experts:** According to your experience, what are the main difficulties for researchers to apply to a H2020 programme?
- **OR Chinese Experts:** According to your experience, what are the main difficulties for researchers to apply to Chinese health related funding programmes?

Summary of the interview	**Notes**

- **EU Experts** : How could the access to H2020 programmes be facilitated for European researchers?
- Or **Chinese Experts**: How could the access to collaborative programmes (e.g. H2020) through co-funding mechanisms be facilitated for Chinese participants?

Summary of the interview	**Notes**

- **EU Experts:** What do you see as the biggest topics' opportunities in Horizon Europe in health research and innovation to improve collaboration between China and Europe?
- **Or Chinese Experts:** What do you see as the biggest topics' opportunities in Chinese programmes in health research and innovation to improve collaboration between China and Europe?

Summary of the interview	**Notes**

Success stories

- Could you give an example of a successful Sino-European health collaborative project?

Summary of the interview	**Notes**

- What made the project successful in your eyes?

Summary of the interview	**Notes**

SENET WP1 – Interview Guideline - researchers

Note to SENET partners: We kindly ask you to return 1 filled in form/interview - Thank you! Please make sure to integrate in the sections "**Summary of the interview" a clean text that can be copied into the public deliverable. The field "notes" is for your own notes or additional comments you wish to share.**

If possible, in case of several NCP/Helpdesk and/or several researchers interviews, could you prepare a synthesis (major points) for the whole interviews of NCP or Researchers?

General information

Interviewing SENET partner	

Interview No.	*(No participant name due to GDPR regulations!)*
Type	☐ Researchers ☐ NCP/Helpdesk
Consent form	☐ Received and signed

Priorities and challenges / trends

- What do you see as the biggest challenge in health research and innovation in China and/or Europe right now?

Summary of the interview	**Notes**

- What are the challenges in health research and innovation in China and/or Europe you see coming up in the next decade?

Summary of the interview	**Notes**

- We are planning knowledge & information exchange between health experts from the EU and China. Which three topics would you suggest to tackle in joint discussions?

Summary of the interview	**Notes**

- What innovative trends in health research and innovation in China and/or Europe do you see coming up in the next decade?

Summary of the interview	**Notes**

- Are these trends in health research and innovation in China and/or Europe mostly influenced by the patients' needs?

Summary of the interview	**Notes**

- Is the development of development of health-related technologies a major concern in China and/or Europe? What kind of technologies are the most being developed?

Funds (co-funding for Chinese researchers) and H2020 programmes

- For European Researchers: Do you know the H2020 health priorities? If yes, do you think the H2020 priorities meet the actual health priorities in Europe you cited at the beginning of the interviews Why/Why not?

Summary of the interview	**Notes**

- For Chinese researchers: Do you know the Chinese co-funding health priorities? If yes, do you think these priorities meet the actual health priorities in China? Why/Why not?

Summary of the interview	**Notes**

- What are the main obstacles for EU applicants to participate in H2020 health related projects with China or for Chinese applicants to Co-funding mechanisms?

Summary of the interview	**Notes**

- How could the access to funding programmes be facilitated for European researchers?

Summary of the interview	**Notes**

- How could the access to funding programmes through co-funding mechanisms be facilitated for Chinese participants?

Summary of the interview	**Notes**

Success stories

Could you give an example of a successful Sino-European health collaborative project?

Summary of the interview	**Notes**

What made the project successful in your eyes?

Summary of the interview	**Notes**

8.3 Relevance of some priorities in interviews

Priority	Metabolic diseases: obesity and cardiovascular disease (CVD)
Relevance in Europe	**Why is it important?** In most adults, a BMI (body mass index) reading of over 30 means they are obese[116]. According to Eurostat, approximately 45% of adults in the EU are overweight and 17% are obese. CVD is a general term for conditions affecting the heart or blood vessels, it is usually associated with a build-up of fatty deposits inside the arteries and an increased risk of blood clots.[117] Each year CVD causes over 1.8 million deaths in the EU, accounting for 37% of all deaths in the EU.[118] In 2015, almost 49 million people were living with CVD in the EU with 6.1 million new cases. CVD is estimated to cost the EU economy €210 billion a year.[119] **How is it supported?** During the first four years of H2020, over €458 million of funding was devoted to 295 research projects on CVD. Out of this portfolio, 42 collaborative research projects with a total EU contribution of over €237 million were funded under the SC1 'Health, Demographic Change and Wellbeing'.[120]
Relevance in China	**Why is it important?** One in five Chinese children are overweight or obese, a dramatic increase from just 1 in 20 in 1995.[121] 5% of Chinese adults are classed as obese.[122] CVD is the leading cause of death in China.[123] **How is it supported?** Obesity is now a subject of many studies, media speculation and greater educational awareness in China. However, specific funding for obesity awareness programmes remains low to non-existent. In 2009, as part of China's $586 billion fiscal stimulus package, the government budgeted for billions more to go into the healthcare system yet none of this went to obesity prevention.[124]

Priority	Ageing
Relevance in Europe	**Why it is important?** Population predictions suggest there will be 66.1 million people aged 80 years and over in the EU by 2080.[125] The old-age dependency ratio (people aged 65 and above relative to those aged 15 to 64) in the EU is projected to increase from 29.6% in 2016 to 51.2% in 2070.[126] **How is it supported?** Given the pace and permanent character of population ageing, new theoretical perspectives are being developed to better understand the nature of population ageing.[127] The EU ran several research projects in the light of EU policies: ASPA - Activating senior potential in ageing Europe; Demhow - Demographic change and housing wealth; LEPAS - Long-run economic perspectives of an ageing society; Maggie - Major ageing and gender issues in Europe; Multilinks - How demographic changes shape intergenerational solidarity, well-being and social integration: a Multilinks framework; Sharelife - Employment and health at 50+: a life history approach to

[116] https://www.nhs.uk/conditions/obesity/ (accessed 30th July 2019)
[117] https://www.nhs.uk/conditions/cardiovascular-disease/ (accessed 30th July 2019)
[118] http://www.ehnheart.org/cvd-statistics.html (accessed 30th July 2019)
[119] http://www.ehnheart.org/cvd-statistics.html (accessed 30th July 2019)
[120] https://ec.europa.eu/research/health/index.cfm?pg=area&areaname=cardiovascular (accessed 30th July 2019)
[121] https://edition.cnn.com/2019/03/19/health/china-obesity-kids-intl/index.html (accessed 30th July 2019)
[122] https://www.who.int/dietphysicalactivity/media/en/gsfs_obesity.pdf (accessed 30th July 2019)
[123] https://www.nature.com/articles/s41569-018-0119-4 (accessed 30th July 2019)
[124] https://www.theguardian.com/global-development-professionals-network/2015/feb/12/chinas-body-mass-time-bomb-policymakers-tackling-rising-obesity (accessed 30th July 2019)
[125] https://ec.europa.eu/eurostat/statistics-explained/index.php/People_in_the_EU_-_population_projections (accessed 30th July 2019)
[126] https://ec.europa.eu/info/news/economy-finance/policy-implications-ageing-examined-new-report-2018-may-25_en (accessed 30th July 2019)
[127] https://www.researchgate.net/publication/264160544_Population_ageing_in_Europe_Facts_implications_and_policies (accessed 30th July 2019)

	European welfare state interventions; SPReW - Generational approach to the social patterns of relation to work Recwowe - reconciling work and welfare in Europe.[128]
Relevance in China	**Why is it important?** By 2050, 330 million Chinese will be over age 65.[129] According to the United Nations, China is ageing more rapidly than almost any country in recent history.[130] **How is it supported?** China's goal is to establish a support network for senior citizens that provides medical care and helps them avoid loneliness through scholarly pursuits and entertainment.[131] It is reported that China is thinking of abandoning the two-child policy as birth rates keep falling.[132]

Priority	Environmental impact on health (asthma/ pollution)
Relevance in Europe	**Why is it important?** In the EU, 8.2% of adults suffer from asthma. In the majority of cases asthma is mild, but severe asthma occurs in 10–20% of patients. Recent calculations estimate direct costs within the EU to be nearly €20 billion. [133] **How is it supported?** The European Parliament Interest Group on Allergy and Asthma is a policy forum to share expertise and align interests engaging with EU policymakers and stakeholders on allergy and asthma health.[134]
Relevance in China	**Why is it important?** Roughly 30 million people in China have asthma, however, only 28% can manage their asthma effectively.[135] Chinese specialists estimated that the number of asthma cases has risen by about 40% in the past five years. The most obvious cause is air pollution, according to the World Bank, China is home to 16 of the planet's 20 worst cities for air quality.[136] **How is it supported?** Poor air quality has been an issue in China for a long time, and efforts to tackle the problem have intensified in recent years. To reduce levels of pollutants in ambient air and to close polluting and outdated industrial capacity are two goals outlined by the government in China's 2020 Air Pollution Action Plan.[137]

Priority	E-Health
Relevance in Europe	**Why it is important?** Digitalisation is meant to facilitate more personalised treatments leading to better outcomes, improving diagnosis and monitoring, ensuring access to cases everywhere, fostering prevention measures as well as improving quality of life through self-management. It can also better allocate resources, both in terms of staff and budget investments. **How is it supported?** E-health is regarded with the highest importance in Europe. The Communication on Digital Transformation of Health and Care in the Digital Single Market identifies three priorities: citizens' secure access to their health data, also across borders; personalised medicine through shared

[128] https://ec.europa.eu/research/social-sciences/pdf/policy_reviews/kina26426enc.pdf (accessed 30th July 2019)
[129] https://time.com/5523805/china-aging-population-working-age/ (accessed 30th July 2019)
[130] https://www.forbes.com/sites/kenrapoza/2017/02/21/chinas-aging-population-becoming-more-of-a-problem/#13bab2da140f (accessed 30th July 2019)
[131] https://www.thoughtco.com/elderly-in-china-4077065 (accessed 30th July 2019)
[132] https://news.cgtn.com/news/3d3d414d3151544d30457a6333566d54/share_p.html (accessed 30th July 2019)
[133] https://err.ersjournals.com/content/24/137/474#ref-1 (accessed 30th July 2019)
[134] https://www.eaaci.org/outreach/eu-activities/european-parliament-interest-group-on-allergy-and-asthma.html (accessed 30th July 2019)
[135] http://www.chinadaily.com.cn/china/2017-05/03/content_29178799.htm (accessed 30th July 2019)
[136] https://www.thelancet.com/journals/lancet/article/PIIS0140-6736%2806%2969267-2/fulltext (accessed 30th July 2019)
[137] https://www.worldsteel.org/media-centre/blog/2019/How-China-is-improving-its-air-quality.html (accessed 30th July 2019)

	European data infrastructure; citizen empowerment with digital tools for user feedback and person-centred care.[138]
Relevance in China	**Why is it important?** With easy access through smartphones and other devices, digital channels have grown to become the main way doctors receive professional information. In 2017, digital platforms were the source of 63% of doctors' information.[139] **How is it supported?** An e-health revolution is taking place in China. The government has thrown its weight behind online healthcare services and is legislating accordingly.[140] The Chinese government marks the public health system construction as the most urgent part of the national medical reform, with information and communication technology being considered as the key of deploying regional collaborative medical services, which is also known as e-Health. [141]

Priority	Medical devices
Relevance in Europe	**Why is it important?** Medical devices make an essential contribution to healthcare in the EU for the benefit of European citizens. Medical devices are also important to the economy, providing €110 billion in sales and 675,000 jobs in Europe.[142] **How is it supported?** The European Medical Device Regulation ensures high standards of quality and safety for medical devices being produced in or supplied to Europe. It is necessary to better identify medical devices products and improve transparency through standard data, technological advances and the establishment of an EU database.[143]
Relevance in China	**Why is it important?** China has become the world's second largest medical device market with an average growth of 20% year-on-year.[144] **How is it supported?** The National Medical Products Administration is responsible for medical devices, drugs, and healthcare services. The organisation is headquartered in Beijing, with offices in each province. [145]

Priority	Health data
Relevance in Europe	**Why is it important?** Health data and data management are crucial when it comes to empowering citizens and building a healthier society.[146] **How is it supported?** The priority of the Communication on Digital Transformation of Health and Care in the Digital Single Market focuses on citizens' secure access to their health data. The goal is to make it possible for citizens to exercise their right to access their health data across the EU[147]. Recommendation for a European Electronic Health Record exchange format sets out a framework for the further development of a European EHR exchange format that will enable citizens to securely access and

[138] https://ec.europa.eu/digital-single-market/en/european-policy-ehealth (accessed 30th July 2019)
[139] https://www2.deloitte.com/insights/us/en/industry/life-sciences/innovative-biopharma-china-digital-health-care.html (accessed 30th July 2019)
[140] https://www.healthcarebusinessinternational.com/the-new-chinese-e-health-revolution/ (accessed 30th July 2019)
[141] https://www.ncbi.nlm.nih.gov/pubmed/19963866 (accessed 30th July 2019)
[142] https://ec.europa.eu/growth/sectors/medical-devices_en (accessed 30th July 2019)
[143] https://prisymid.com/blog/european-medical-device-regulations-mdr/ (accessed 30th July 2019)
[144] https://www.nortonrosefulbright.com/en/knowledge/publications/0bec061f/tapping-into-chinas-medical-devices-industry (accessed 30th July 2019)
[145] https://www.pacificbridgemedical.com/regulatory-services/medical-device/product-registration/china/ (accessed 30th July 2019)
[146] https://ec.europa.eu/digital-single-market/en/managing-health-data (accessed 30th July 2019)
[147] https://ec.europa.eu/digital-single-market/en/managing-health-data (accessed the 30th July 2019)

	exchange their health data across borders in the EU. Together with laying down a set of common technical specifications for the cross-border exchange of data, the recommendation defines a set of principles that should govern this exchange and a process for further development, monitoring and review. The recommendation underlines that moving towards interoperable electronic health records in the EU should go hand in hand with ensuring data protection and security, in line with the GDPR, and full compliance with the cybersecurity framework.[148]
Relevance in China	**Why is it important?** China's large population and universal healthcare system provide rich sources of data, and interest in the application of big data to medicine has grown in the past few years. [149] **How is it supported?** In June 2016, the State Council of China issued an official notice on the development and use of big data (high-volume, high-velocity and/or high-variety information assets) in the healthcare sector. The council acknowledged that big data in health and medicine was a strategic national resource and their development could improve healthcare in China.[150]

[148] https://ec.europa.eu/digital-single-market/en/exchange-electronic-health-records-across-eu (accessed 30th July 2019)
[149] https://www.bmj.com/content/bmj/360/bmj.j5910.full.pdf (accessed 30th July 2019)
[150] https://www.bmj.com/content/360/bmj.j5910 (accessed 30th July 2019)