



# Human Brain Project

## Citizens' view on neuroscience and dual use [Malta]

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## Content

Summary of results.....	3
Results from Round 1: Research and Dual Use - Overall principles .....	4
Results from Round 2: three areas of research.....	7
Medicine.....	7
Artificial intelligence (computer learning).....	7
Brain-computer interfaces .....	8
Cross-cutting.....	9
Results from Round 3: Questions to address in the future .....	10
Key themes across rounds.....	12
Questionnaires .....	13
Start of the day questionnaire.....	13
End of the day questionnaire .....	14
Demographic profile of participating citizens .....	17
Annex 1 – Translated templates from round 1 .....	19
Annex 2 – Translated templates from round 2 .....	31
Annex 3 – Translated templates from round 3 .....	43
Annex 4 – Results from morning survey.....	49
QUESTIONNAIRE ON NEUROSCIENCE AND DUAL USE .....	49
Annex 5 – Results from afternoon survey .....	50
QUESTIONNAIRE ON NEUROSCIENCE AND DUAL USE .....	50



## Summary of results

It is relevant to indicate that since most of the participants were not very knowledgeable and, at the same time, still held strong convictions on the subject, most of what the participants communicated reveals more about their uncertainty rather than being an implication against progress and developments in technology.

The participants had many positive considerations towards neuroscience, some of which included the possibility of enhancing lifestyles and improvements in living conditions, precise and quicker diagnoses, and as a consequence, better capacity for more exact, adequate and powerful treatment of diverse conditions and diseases. Importance and value were given to the positive and humane outcomes and ramifications of the research. Participants were not very concerned, generally speaking, about resisting the potential for dual use of research although the emphasis often was on avoiding abuse of the results of research rather than on dual use. Nonetheless, they stood firm to the belief that EU funding is directed towards always seeking to holistically benefit civil society and not just the selected few, or even worse, only the wealthy, the privileged or those in the higher classes of society. Moreover, many participants questioned the concept of ethics and the possibility of humanity losing control on what itself created. The discussions at times focussed on the importance of critical educated citizens with good ethical principles and who value human life.

In every round and across all six tables, the participants affirmed the need to have rules, guidelines and frameworks for research and also its usage and discharge with ethical ground rules designating what can be done, what is to be avoided and also what is to be completely renounced. The dilemmas that were frequently indicated included: whether we are capable of keeping up with the fast moving progresses; whether we will still be capable of having control on our emotions; whether the enhanced way of living will be available for everybody, irrespective of age, sex, race and financial status. Furthermore, it seems like after the workshop, some of the participants remained rather sceptical and are still less likely to agree with the idea of collaboration with organisations working for or receiving funding from defence agencies.

The overall conclusion for the workshop was that the participants were in most cases positive about the advantages and importance of neuroscience. Albeit, there was very little awareness and knowledge on its potential for dual use. The majority of participants considered and concluded that the positive aspects and potential attributed to neuroscience surpasses the potential risks and negative consequences. Concurrently, participants declared that they had little capacity and power over the developments that are taking place and the research that is being conducted. In their perspective, what matters most is that the citizens are never alienated and nonetheless mislead.



## Results from Round 1: Research and Dual Use - Overall principles

At the beginning of the workshop, participants were asked to write on post-it's the main ideas that come to their mind when they hear the word "neuroscience". Many of the participants gave what many may refer to as the dictionary definition of the term, describing it as a field of study which delves into "the functions and states of the different parts of the brain". A large number of respondents had a really clear understanding of the concept and they managed to present a comprehensive interpretation of the term, some of who described it as "the study of how the brain is wired and how it functions, whether neurons are fired up in the left or right side of the brain and how it makes the person act and behave". There were also a few participants who got perplexed by the concept and answered that they knew nothing about it. On the other hand, there was a good portion of the participants that gave their insight and belief on the subject, some of who described it as "very interesting... its potential is limitless and it should be given more importance", another comment was that if the subject had to be given more status it can render "a better understanding of tomorrow".

In the first round of group discussions, the groups were asked to discuss together their concerns in the scenario where publicly funded research could have dual usage, that being; civilian application and military applications. None of the groups really agreed on one reaction to this question. The answers were different and often reflected what each participant valued in life. Discussions diverged from stating that such dual use is "inevitable", some participants expressed their worries with regards to the effect of dual use on vulnerable people and also on animals. Something which was common amongst all groups was the importance that they gave to awareness and how vital it is to make people receptive of what is happening through education. The participants also expressed that this is quite paradoxical and that although they have merely no choice/say on what and how research is conducted, they insisted that the collected data is to be made public.

When asked whether in their opinion such research and dual use was to be considered either problematic or reassuring, the perceptions were mixed, albeit, the overall conviction was that the benefits that may be reaped will outweigh the risks. Those who suggested that the situation is problematic insisted that control is critical, others believed that "there is already enough military research" and that even if it is for defence, "people will suffer". Another portion of the participants suggested that although they accept such dual use, they do so with reservations as if it had "to fall in the wrong hands it will be catastrophic". An interesting comment was that such judgment is of a subjective nature and that awareness and education is of paramount importance. Notwithstanding the fact that many individuals had reservations, this does not imply that the groups were against the advancing research on neuroscience and its potential for dual usage. A recurring statement emphasized that the highest degree of reassurance is attained when the respective research being carried out is being done with the main intention of improving the quality of life, especially in the medical field. On the other hand, when it comes to its military use, the persisting remarks were that such use may be "alarming". Thus, while a good number of participants expressed uneasiness towards the prospects of neuroscience results being abused for military purposes, most of them also asserted that such outcome is inevitable. The honest application of dual use was mostly linked to practices which contributed



to the wellbeing of the civil society that saved lives, and also ones which aided soldiers in dealing with war traumas.

The third question in Round 1 dealt with the possible concerns that participants might have with regards to the possible use of the research results by the military and intelligence agencies. It was generally considered that as long as the results are not used to dehumanise people, either biologically or simply by impeding on their freedom, they should be supported. Intelligence agencies are perceived by many of the participants as forces that protect the societies and that give them equanimity. A certain concern was about politics and their power on warfare, some groups showed their uneasiness towards the potentiality of abuses in political applications and their ability to produce destruction. Question 4 expanded on the concept of usage by military and intelligence agencies through the extent that they might be used for either defence or counter-terrorism and challenged the participants to analyse the difference between the two usages. The concept of dealing with counter-terrorism was applauded by all, however, defence was not understood by most of the participants. Moreover, defence was in most cases apprehended negatively and it was specified that “the ends must not justify the means”. The portion of participants that expressed that such dual use and by whom does not create any differences, still made it a point that the value of human life is to be preserved in all aspects.

When it comes to the question of whether the Human Brain Project is to assist and collaborate with research initiatives and organisations that work for or receive funding from defence agencies, the groups widely agreed that the HBP should engage in such cooperation. A common justification was that sharing knowledge is always good and that limiting research would not solve any problems and also would not keep away any threats. Participants also mentioned that since research is by its very nature very time consuming and very costly to conduct, collaboration and teamwork will nonetheless ease the process and enhance the result. Again, for this question, the groups emphasized the importance of educating the people and that authorities should refrain from alienating the people who are mostly to be affected by the outcomes. Some groups also expressed their uncertainty regarding openness of research. They, however, asserted that in the scenario where restrictions are in place and all is monitored nothing will be improper as abusers will be easily uncovered. Furthermore, when asked whether it is acceptable for them for an organisation to receive funding through the HBP for their civilian research, if they at the same time are conducting military funded research, the reactions were mixed and the subsequent reasons had a great deal of similarity across tables. The main opinion on this was that there is nothing wrong in funding a research that is done ethically. Moreover, the overriding idea was that funding should be given based on accountability and that parameters should be set. The respective history and track record of the organisation is also to be taken into consideration.

Without any shadow of doubt, the topics of the questions for Round 1 overlapped and it is safe to say that there was a great deal of similarity across the six tables. A broad percentage of the participants showed their concern in relation to the importance of holistic education and the cultivation of awareness amongst the people, regardless of whether the respective research is to be used for military or civilian purposes. This sequentially led to the second most important point which concerned most of the participants, that is the safeguarding and respecting of the human being.

Ultimately, neither the research nor its potential of dual usage was deemed as worrisome to the participants. There was a unanimous agreement that if such is done ethically and without dehumanising



the individual, it has the potential to effect people positively in several ways such as enhancing their lifestyles, save their lives and also broaden their capabilities. The issue which worried many was that of the abuse by those in power who have the potential to create a catastrophe if only they choose to use such research as a means to manipulate the people. Having said that, the participants were enthusiastic of the continuation of research in this area as they understood that the positive results, will hopefully counterbalance the negative risks that such research may bring about. It was considered imperative amongst the participants that the main aim of all will be to help the civil society and all its citizens, to have better living conditions, a safer environment and also that the same citizens are kept informed and educated in a way which does not create any doubt or alarm.



## Results from Round 2: three areas of research

### Medicine

According to the four groups that discussed the potential developments in medicine induced by neuroscience, the indicated positive aspects were principally the ability to develop more accurate diagnosis and that of mankind giving/having more knowledge about mankind. A wide degree of importance was also given to the fact that when such development is spread there will be less expenses related to the treatment of such illnesses. Amongst all participants was a recognition that enhancement of this field will support and promote a better quality of life and let up on health related hardships.

When it comes to the negative aspects of medical applications, the main focus was on the misuse of dual use. Participants expressed their doubts in the scenario where research is abused for the manipulation and for the controlling of the crowd. There was a general uncertainty on the side effects as since most of the advancements and treatments are quite recent, the situation makes it uneasy to detect negative aftereffects. Two particular participants were concerned that many people are not questioning what is being given to them and that as long as people heal, they are happy to act as experimental subjects, referred to as “guinea pigs”.

Since this subject effects directly almost everyone, dilemmas were numerous and participants all shared their preoccupations which included the fact that while such advancements are solving many problems, they are at the same time creating new ones. The participants focused also on preferences, they established mixed feelings on who will benefit the most and who will be left behind. Having said that, the main argument was whether such advancement will only serve the wealthy few and disregard those who cannot pay.

When asked whether the positive aspects of such advancement in medicine outweighed the negative, most of the participants were positive that the beneficial outcomes are greater. However, there were still a certain few that expressed their belief that there will be more negative impacts when compared to the positive ones.

The last question dealt with whether the participants are concerned about this research being conducted, three groups were fully concerned, while one emphasised that they were sceptical about the situation. Another group specified that what they referred to as “the testing phase” was a concern and that “negative issues exist anyhow”, therefore, it is better to extract and seize the good.

### Artificial intelligence (computer learning)

Artificial intelligence was talked about and explored by four groups. The substance of each discussion on the different tables was quite similar. When it comes to the positive aspects of such development, it was quite held in common that artificial intelligence is helping humans enter waters where they were usually physically restricted to do so. Another common view was that computer intelligent systems abolish human error. An interesting discussion delved into the ability that such artificial intelligence gives the human to make more objective judgements which will lead to more impartial and far-reaching results. Other positive aspects incorporated the benefit of easier access to information, a bigger opportunity for more



comprehensive possibilities and also that of improving living conditions through the offloading of jobs that are tedious and boring.

When it comes to the negative aspects of artificial intelligence, the most recurrent theme was “laziness” and that people will be willing to give up on their sovereignty for comfort. Another regard was that of the loss of jobs and the possible crisis of robots taking the roles of humans. Participants asked questions such as “what will happen with the human life?” and “will life still be rewarding?”, such disillusion brought about again the problem of the fear of dehumanisation and potential impaired ethical judgments.

The predominant dilemma amongst the tables was that of the funding of such development and the intention of those who are investing in it. Another prevailing dilemma was whether humans are aware on where to stop and the capacity for moral judgements in all of this.

The last question posed to the participants in the sphere of artificial intelligence dealt with the concern that they held in relation to the kind of research/ development that is being carried out. Participants generally suggested that such an answer is subjective and that if the research and ultimate developments are used for good causes, there was nothing problematic. On the other hand, if such development is abused, many are concerned that in reality we have little power and are as a matter of fact helpless in changing the outcomes.

### **Brain-computer interfaces**

Amongst all the four groups that delved into and discussed brain-computer-interfaces was a certain common ground which emphasised the beneficial role that such progress delivers. Improvements in the ways and methods of educating people were valued by many participants. Moreover, many expressed their positive attitude towards its medical use and how it boosts the effect and precision of treatments. When it comes to military usage, many shared the point of view that there will be more accurate attacks where less civilians will die. An interesting perspective went around the alleviation that such development is giving to amputees, where they are seen becoming more independent.

The discussed negative aspect revolved around the military and how it is using technology that is invasive and destructive. Many were also concerned about the prospect of being watched and expressed their worries that what we actually read in dystopian novels might become a reality where there will always be a “big brother watching”. One of the tables agreed that “we are going at a momentum” and that a time will come when if we are not in control of the situation it will only be a case of “survival of the fittest”.

Dilemmas were again aplenty as many participants questioned the fast pace that science is moving in, and at the same time the lack of education and awareness amongst the people who are being directly affected. The issue of how this progress and its ramifications will be shared was also debated, many are preoccupied that the advancements will only be accessible to the rich and most privileged.

On the question as to whether the positive aspects outweigh the negative ones, most of the participants agreed that “for now” the positive counterbalances the negative. When it comes to the concern of the participants with regards to the implementation of such research and development, most of the participants expressed their support and trust in the implementation of such. Nonetheless, there were



others who expressed their willingness to get a better picture of why it is being conducted and ones who further asserted that “knowledge is power, even if negative, we can do something about it”.

### **Cross-cutting**

Many topics of the questions overlapped and there was a great deal of similarity across the six tables. In terms of the positive aspects, the improvements in diagnoses related to illnesses was one of the emerging and highly valued positive outcome of developments. It was reasoned that earlier identification of problems related to health would contribute to a better and more precise medical treatment.

A negative aspect which was brought up and discussed by all groups was the dehumanising tendencies that such development is capable of rendering. Almost all of the participants were concerned about invasion and how such advancements have the potential to impede on individual privacy. Furthermore, the aspects of control, awareness and education were all considered to be vital for there to be a smooth and profitable outcome from all development.

The dilemmas that were frequently indicated included: whether we are capable of keeping up with the fast moving progresses; whether we will still be capable of having control on our emotions; whether the enhanced way of living will be available for everybody or only for the rich and the privileged, irrespective of age, sex, race and financial status. Last but not least, many participants questioned the degree to which ethics are being taken into consideration and also the importance of ethics to be encompassed in everything that is determined.

In all the three example areas, the participants appeared to be quite supportive of research but at the same time continuously called attention to the importance of control and respect of humanity.



## Results from Round 3: Questions to address in the future

### Top 10 questions:

1. (22 votes):  
*Will the European Communities be willing to fund such research, if such research had to be of a non-profit nature but only aimed at educating and empowering the citizens?* (Question for policy-maker's researchers and stakeholders, categorised under holistic education/ ethics)
2. (21 votes):  
*How can the results that come out of a study be safeguarded for good use?* (Question for policy-makers and researchers, categorised under politics)
3. (21 votes):  
*Can you ensure that findings for this project come from an ethical source which has no negative bias?* (Question for researchers and stakeholders)
4. (21 votes):  
*What checks are in place or will be put in to place to counter systems with malicious intentions?* (question for policy makers, categorised under policy)
5. (21 votes):  
*How are you going to ensure that the research does not get off track? I.e. take another direction than the one 'commissioned'* (Question for policy-makers)
6. (19 votes):  
*Who/what regulated/controls/includes/excludes the following: usage; intention; results; products algorithms; methods; dosages?* (Question for policy-makers and stakeholders, categorised under medical-cure)
7. (15 votes):  
*How can we ensure that the advances in neuroscience are accompanied by investment and advances in education and ethical studies?* (Question for policy-makers)
8. (15 votes):  
*Can there be more research to cure disease, to facilitate peoples' life and less research to mass destruct the population?* (Question for policy-makers)
9. (14 votes):  
*Who gets to choose what population gets chosen for a particular type of trial?* (Question for researchers, categorised under medicine)



10. (14 votes):

*How can researchers guarantee that our civil rights are safe-guarded?* (Question for researchers, categorised under Politics)

Most questions were directed at policy makers and researchers, with 28 and 21 questions directed at each respectively, which is far more than citizens and stakeholders with 10 and 15 questions, respectively.

As to the content of the most voted for questions, there was also a clear tendency, which follows some of the themes from the previous rounds. Of the 10 questions, half revolved around the transparency and the avoidance of bias of the respective research, the criteria, rules, ethics and morals and to what extent is the protection of each citizen being taken into consideration. Two questions addressed the checks that are conducted in order to protect such results from being seized by the wrong hands and also asked for more information regarding who will be making economic gains in such scenarios. Another interesting question concerned the reliability of sources and inquired further clarifications on how bias is kept afar.



## Key themes across rounds

The principal subject matter that reappeared across most of rounds on every table was that although participants are very much endorsing research in the field of neuroscience, at the same time they are still very much advocating the importance of setting up core foundations, ethics, rules, criteria and guidelines in order for the dual use of the resulting research to be valuable and constructive.

The positive attributes and potential related to the handling of dual use research in neuroscience mainly revolved around the improvement of lifestyles, altered living conditions and a better rounded method of diagnoses. When compared to the two other subjects, medicine and its relation to health was very much debated, especially in areas of mental disorders, amputations and problems with eyesight. In most cases, the most valued requisite was that the research conducted by the HBP and other publicly funded research initiatives are to contribute to the mass of the civil society and not just the very few who are privileged and who can pay for the service or treatment, therefore, eliminating discrimination in the allocation of advancements.

The participants were less worried about the potential positive use of dual use of such research, and more preoccupied by the abuse of such. The most acclaimed concerns were related to the degree of control that citizens have over the numerous patterns and behaviours of manipulation. It was agreed on all of the tables that whatever advancements are developed, those in power and the people themselves should always respect the nature of humanity and its appeal for liberty and privacy.



## Questionnaires

### Start of the day questionnaire

At the beginning of the workshop, the participants were asked to fill in a questionnaire that consisted of four questions. The first question addressed the extent to which participants feel concerned about the potentiality of the HBP research being used by others for political, security, intelligence or military purposes, on a scale from 1-5. “Not at all concerned” to “Extremely concerned”. Five out of thirty-two participants answered that they were slightly concerned, and six answered that they were moderately concerned. Seven listed that were extremely concerned, while another seven were not concerned at all. The second question dealt with whether publicly funded research that has dual use potential, should still be allowed. Out of 32 participants, 28 answered positively and only one participant answered negatively with a “no”. Furthermore, three participants answered that they did not know / wish to answer. The third question asked whether the HBP should cooperate with other research initiatives or organisations that receive funding from or work for defence agencies. Four participants answered with a “no”, while eight answered “yes, but only initiatives or organisations in countries that have signed and ratified international treaties on e.g. chemical or biological weapons”. Only one participant answered “Yes, the most important thing is to make progress in the research”. Fourteen participants answered that they “do not know/ do not wish to answer”. The last question asked whether the European Commission’s focus and commitment to open science should also be maintained with research that has the potential for dual use. Twenty-three participants answered positively with a yes, while three answered negatively with a “no”, six participants answered that they did not know or wish to give an answer. These results may reveal that previous to workshop, many of the participants were mostly unsure/unaware of the dual use potential of research.



### End of the day questionnaire

At the end of the workshop, the participants were again asked to fill in the same questionnaire that they filled in the morning. This was done in order to identify whether the workshop had in anyway affected their opinion and outlook.

The first question addressed the extent to which participants feel concerned about the potentiality of the HBP research being used by others for political, security, intelligence or military purposes, on a scale from 1-5. "Not at all concerned" to "Extremely concerned". Five out of the thirty-two participants answered that they were slightly concerned, and seven answered that they were moderately concerned. Seven listed that were extremely concerned, while four were not concerned at all. This suggests that participants became less concerned after the workshop.

The second question dealt with whether publicly funded research that has dual use potential, should still be allowed. Out of 32 participants, nineteen participants answered positively and only one participant answered negatively with a "no". Furthermore, twelve participants answered that they did not know / wish to answer. Nineteen said yes, as opposed to twenty-eight in the morning, this may convey that after the workshop some participants might have become more sceptical on the dual use of research.

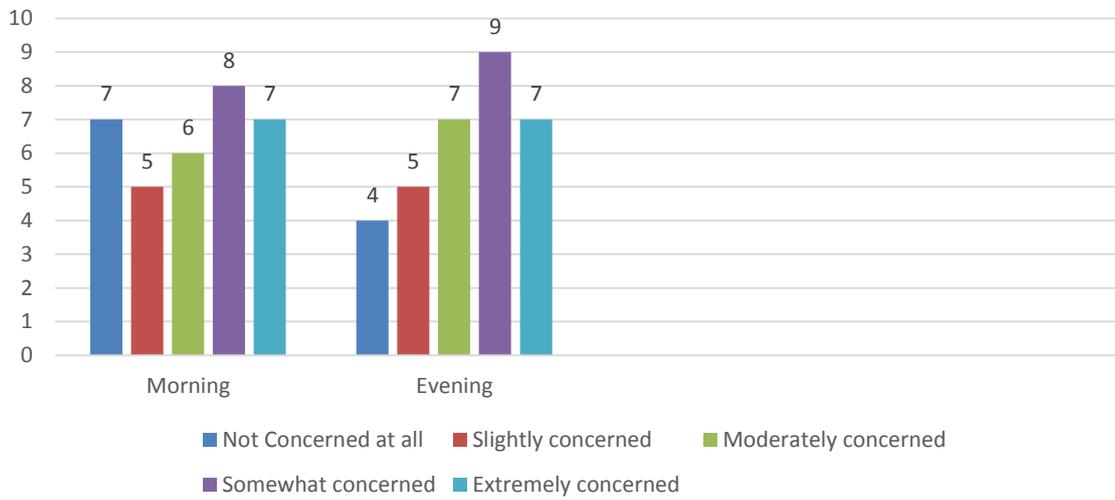
The third question asked whether the HBP should cooperate with other research initiatives or organisations that receive funding from or work for defence agencies. Five participants answered with a "no", while twelve answered "yes, but only initiatives or organisations in countries that have signed and ratified international treaties on e.g. chemical or biological weapons". Eight participant answered "Yes, the most important thing is to make progress in the research". Seven participants answered that they "do not know/ do not wish to answer".

As for the last question, participants were asked whether the European Commission's focus and commitment to open science should also be maintained with research that has the potential for dual use. Twenty participants answered positively with a "yes", while six answered negatively with a "no", six participants answered that they did not know or wish to give an answer. Positive answers to this question decreased by the end of the workshop while negative answers ("no"), increased.

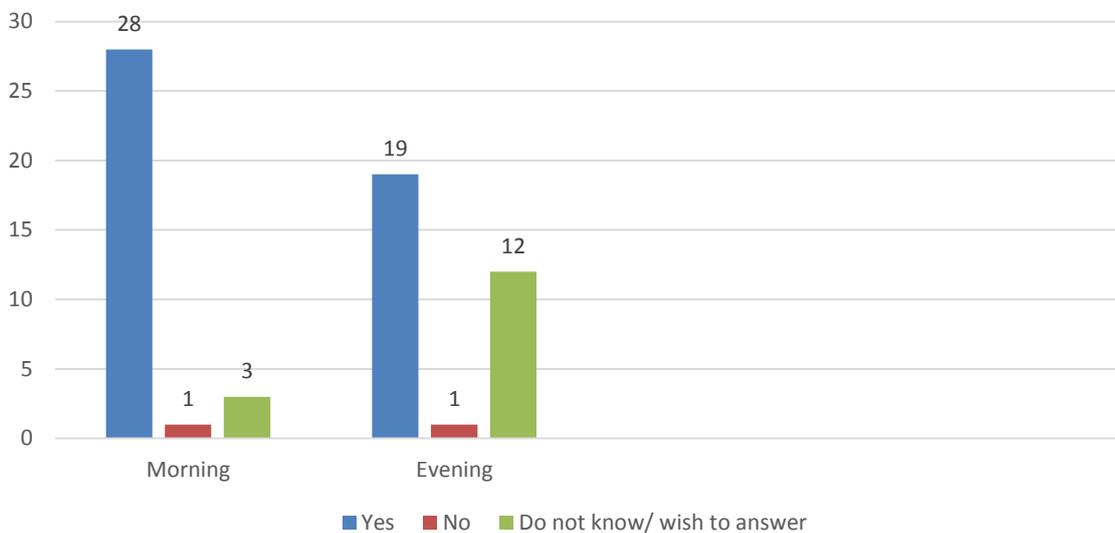
It seems like for some of the participants, the more they learnt and discussed about the dual use of research and its potential, the more concerned and less likely they become to comply with organisations and initiatives working for or receiving funding from defence agencies.



Question 1: Does it make you concerned that the research from the HBP could be used by others for political, security, intelligence and military purposes?

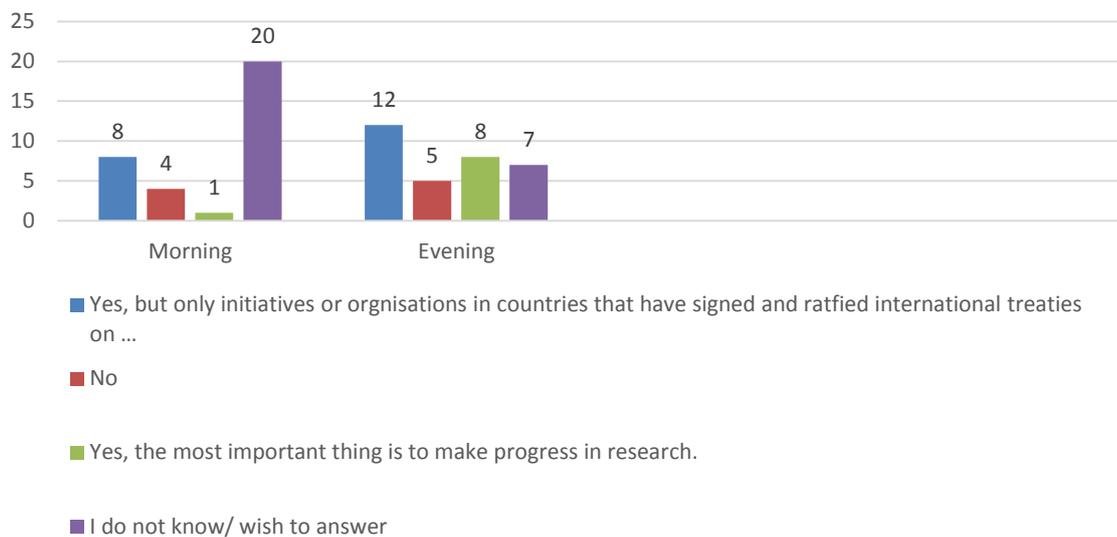


Question 2: If publicly funded research have dual use potential, should it then be allowed?

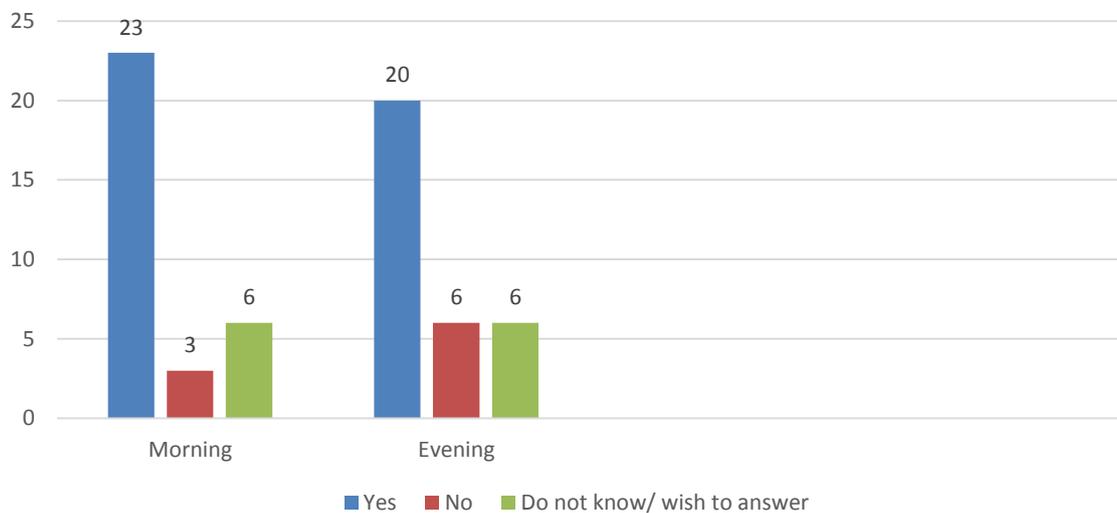




Question 3 : As a European funded project we are not allowed to do military research. However, other research initiatives on the human brain may be funded by defence agencies. Should the project collaborate with other brain initiatives or organisations th



Question 4: The European Commission has big focus on open science, where research data and analyses are public for everyone. Should this also be the case with research that could have dual use potential ?





## Demographic profile of participating citizens

*Description of how well the participating citizens reflect the population in your country:*

The age distribution of the participants that participated on the day, is rather well dispersed. The same goes for the representation of men and women.

The results are very much close to the Maltese demographics except for those in the area of education. Only four citizens amongst those who signed up for the workshop had primary and lower secondary education. On the other end of the scale, there was an overrepresentation of people with master's degrees or equivalent and doctoral degree, that is 20 participants.

### Data on the participating citizens:

Age:	Participants confirmed for the workshop	Participants showed up for the workshop	Percentage of the age group compared to the general population
18-29:	8	6	19% (18%)
30-39:	8	5	15.5% (19%)
40-49:	7	6	19% (16%)
50-59:	7	5	15.5% (16%)
60-69:	6	5	15.5% (16%)
>70:	6	5	15.5% (16%)

Gender:	Participants confirmed for the workshop	Participants showed up for the workshop	Percentage of the gender (general population)
Men:	19	17	53% (50%)
Women:	23	15	47% (50%)

Education	Participants confirmed for the workshop	Participants showed up for the workshop	Percentage of the age group compared to the general population
General upper secondary education :	5	4	13% (56%)



Bachelor or equivalent:	10	8	25% (27%)
Tertiary education :	26	20	62% (17%)

Geographical zone (percentage of population living in...):	Participants confirmed for the workshop	Participants showed up for the workshop	Percentage of the age group compared to the general population
Town:	22	17	47% (48%)
Rural:	20	15	53% (52%)

**Other aspects of relevance in your country?**  
**People with lower education levels might have been scared about the subject matter.**



## Annex 1 – Translated templates from round 1

### TABLE 1, Template 1

*What do you think about the fact that public research intended for civilian use can be used by the military or intelligence agencies?*

- “Although it was not our choice, it is a good thing that the data is public and not hidden from us”.
- Compared to a paradox.
- “The pursuit of knowledge is free to all people. While this can result in unintended uses, it is more fruitful to be aware of and hold accountable, such unintended adaptations, then to stifle the sharing of knowledge”.
- “It depends, sometimes it can be beneficial”.
- “I agree that research should always be open because it my belief that different researchers bring different perspectives to research which moves research forward”.

*Do you find it problematic or reassuring? Please explain (why/why not).*

**Problematic:**

- Needs to be controlled.
- Progress would turn into problems.
- “What if it is used badly?”.
- “History has shown that it is often used for harm”.

**Reassuring:**

- “We trust in the EU, that it will control its use”.
- Research is neutral.

*What, if anything, concerns you about the possible use of the research results by the military or intelligence agencies?*

- The effect on innocent civilians, whether in war or in everyday life.
- “If it is used for the advancement and unity of nations, then it is good”.
- Manipulation of control of civilian populations.
- Stifling the freedom of expression.
- Concerned about the purpose of research.
- Governments and military have large funds.

*Does it make a difference if the use of the research by the military or Intelligence agencies is for defence or counter-terrorism purposes?*

- It makes a big difference as long as it is used for counter-terrorism.
- One needs to ensure that those labelled as terrorists are actually terrorists.
- “Terrorism is funded; we never have a say with higher intelligence”.
- “As long as the value of human life is preserved in all directions...”
- “No exceptions should be made!”.
- We will end up losing our identity.

**TABLE 1, Template 2**

*As a European funded project, we are not allowed to do military research. However, other research initiatives on the human brain may be funded by defence agencies. It is in general an integrated part of research to collaborate with other researchers in the same field, or at least sharing knowledge and results, in order to move the field/research forward. Should the project collaborate with other brain research initiatives or organisations that work for or receive financial support from defence agencies, e.g. the American “Brain Initiative” or the Chinese “China Brain Project”?*

- Group was split but leaned more towards “yes”.

*Please explain why/why not.*

- “Larger collaboration”.
- “Bigger pooling of funds”.

*Can an organisation receive funding through the Human Brain Project for their civilian research, if they at the same time do military funded research?*

- Group was split and did not lean towards any direction.

*Please explain why/why not.*

- As long as the data is public, the group agreed that it should be allowed”.



TABLE 2, Template 1

*What do you think about the fact that public research intended for civilian use can be used by the military or intelligence agencies?*

- “The reputation of the potential collaboration partner should be taken into consideration with the real prospect of withholding research likely to be used against civilian purposes”.
- “Collaboration helps us know more, have more say and can set rules”.
- “Open collaboration is difficult”
- Essentially, there is nothing wrong with this dual use, but it must be controlled/regulated/monitored and supervised.
- Although it has happened so far and it seems an inevitability, it is extremely dangerous and can jeopardize human existence.

*Do you find it problematic or reassuring? Please explain (why/why not).*

It is a problematic situation: (x4)

- It will turn bad for sure.
- Needs to be controlled.
- “Progress will turn into regress”.
- “People will always suffer!”

Reassuring: (x2)

- “Authorities know what they are doing!”

*What, if anything, concerns you about the possible use of the research results by the military or intelligence agencies?*

- Military secrecy is a problem.
- “Funding sources and bias”.
- “The truth!”.
- “Nothing!”.
- “I lean more towards the positive aspects of such”.
- “harming civilians”.

*Does it make a difference if the use of the research by the military or Intelligence agencies is for defence or counter-terrorism purposes?*

- “No exceptions should be made”.
- “The can still be misuse!”
- “If it is used for counter-terrorism it is acceptable but if it is used as a defence by a country/ individual it is terrifying!”
- “Yes!”
- “Yes it should be used with caution.”
- “The end should never justify the means”.



**TABLE 2, Template 2**

*As a European funded project, we are not allowed to do military research. However, other research initiatives on the human brain may be funded by defence agencies. It is in general an integrated part of research to collaborate with other researchers in the same field, or at least sharing knowledge and results, in order to move the field/research forward. Should the project collaborate with other brain research initiatives or organisations that work for or receive financial support from defence agencies, e.g. the American “Brain Initiative” or the Chinese “China Brain Project”?*

No/Yes

*Please explain why/why not.*

- “They can but they should not!”
- “Agree”
- “Depends on what they are doing- if for protection of humans then no”.
- No they should not as it’s like the HBP itself is doing military research!”
- “Indirectly this would mean that the HBP results would end up in military”.
- “As long as it is monitored collaboration, and if this is used for defence + security”.
- It might still be risky.
- “Clear consensus is needed and also knowing what the enemy is doing is vital!”.

*Can an organisation receive funding through the Human Brain Project for their civilian research, if they at the same time do military funded research?*

Yes (x 3)  
No (x1)

*Please explain why/why not.*

- “It is right to fund as long as research is done right”.
- “Funding should be given based on accountability”.
- “It is a good way to know what is happening but there should still be limits”.
- “Due diligence needs to be done”,
- one participant will not allow it because they do not trust as from his point-of-view there are always bad intentions.



TABLE 3, Template 1

*What do you think about the fact that public research intended for civilian use can be used by the military or intelligence agencies?*

- “Collaboration helps us know more, have more say and can set rules”.
- “It is important that the outcomes of the research are utilised by everyone”.
- “This is inevitable”.
- “Worried about the vulnerable people”.
- “Research should not be against animals”.

*Do you find it problematic or reassuring? Please explain (why/why not).*

- “OK if used by everyone”.
- “Slightly worried if research is used in a bad way”.
- “Worried!”.
- Reassuring the areas of counter-terrorism.
- “Slightly worried, if used to harm people”.

*What, if anything, concerns you about the possible use of the research results by the military or intelligence agencies?*

- “They may invent something that limits humans from using same research”.
- “I am positive that the use of medicine can help reduce people’s capabilities”.
- “When it comes to intelligence agencies, I am not worried as they are trying to catch criminals”.
- “Criminals could get stronger everyday”.
- “This can help catching drug lords”.

*Does it make a difference if the use of the research by the military or Intelligence agencies is for defence or counter-terrorism purposes?*

Counterterrorism is defence – we must think about:

- Individual and social awareness and consciousness
- Ethics and emotional aspects

**TABLE 3, Template 2**

*As a European funded project, we are not allowed to do military research. However, other research initiatives on the human brain may be funded by defence agencies. It is in general an integrated part of research to collaborate with other researchers in the same field, or at least sharing knowledge and results, in order to move the field/research forward. Should the project collaborate with other brain research initiatives or organisations that work for or receive financial support from defence agencies, e.g. the American “Brain Initiative” or the Chinese “China Brain Project”?*

- Yes (x4)
- No (x2)

*Please explain why/why not.*

- “This will lead to improvements”.
- “They should not!”
- “As long as the intentions are completely positive”.
- “It will be abused!”

*Can an organisation receive funding through the Human Brain Project for their civilian research, if they at the same time do military funded research?*

- Yes (x4)
- No (x2)

*Please explain why/why not.*

- “As long as it is based on ethical judgements, it is fine”.



TABLE 4, Template 1

*What do you think about the fact that public research intended for civilian use can be used by the military or intelligence agencies?*

- The use for military and/or intelligence purposes has been going on for a long time, but civil society is unaware of the impact. The risks should be debated.
- I do not think that military use is wrong, but power cannot be centred in a single group.
- I have doubts that public opinion can influence the process.
- It is difficult for civil society to change things because of the power of institutions, but we can change the opinion of researchers working in these areas; and we can influence laws. There is power in citizens and civil society/research/ethics institutions.
- "A way of life..."

*Do you find it problematic or reassuring? Please explain (why/why not).*

Problematic:

- Warfare abuse.
- "Problematic if used for negative purposes!".
- "They take advantage to gain power, money and destroy humanity".

Reassuring:

- "It makes a difference to more peace of mind".
- That good judgement and dialogue arise between civilian and military institutions.

*What, if anything, concerns you about the possible use of the research results by the military or intelligence agencies?*

- "As long as it helps humanity, I have no concerns".
- "The motive".
- "Bias".
- "Abusing of vulnerable people"
- "We have little control".

*Does it make a difference if the use of the research by the military or Intelligence agencies is for defence or counter-terrorism purposes?*

- It's the same, because it depends on the ethical/good and evil concepts in different cultures;
- The best defence could be the attack.

**TABLE 4, Template 2**

*As a European funded project, we are not allowed to do military research. However, other research initiatives on the human brain may be funded by defence agencies. It is in general an integrated part of research to collaborate with other researchers in the same field, or at least sharing knowledge and results, in order to move the field/research forward. Should the project collaborate with other brain research initiatives or organisations that work for or receive financial support from defence agencies, e.g. the American “Brain Initiative” or the Chinese “China Brain Project”?*

- Yes (x5)
- No (x1)

*Please explain why/why not.*

- “I think that information can always lead to improvements”.
- “Morally, they should not!”
- “Information is accessible, might as well use it”.
- “As long as the intentions are completely positive”.

*Can an organisation receive funding through the Human Brain Project for their civilian research, if they at the same time do military funded research?*

- Yes (x4)
- No (x2)

*Please explain why/why not.*

- “Is the military research for good or for bad intentions?”.
- “Rather err on the side of caution”.
- “It is always imperative to exert limitations”.



TABLE 5, Template 1

*What do you think about the fact that public research intended for civilian use can be used by the military or intelligence agencies?*

- “I do not understand wars”.
- Education and awareness is vital.
- “I think that information is to be shared as it can lead to the improvement in the treatment of different conditions”.
- “Since there can be dual use, once the results are used for the good of humanity, I agree that it should be used!”.
- Interpretation of research is vital.

*Do you find it problematic or reassuring? Please explain (why/why not).*

Problematic (x 5):

- Most of the participants on table agreed upon the fact that it can be used against what is considered right.

Reassuring (x1):

- “I accept it with reservations”

*What, if anything, concerns you about the possible use of the research results by the military or intelligence agencies?*

- “What are the limits?”.
- “My concern is on all levels”.
- “Will it really serve the common good?”.
- “I am totally against robots; humans should step up their game to always be in the lead”.
- The good interpretation of results is very important.

*Does it make a difference if the use of the research by the military or Intelligence agencies is for defence or counter-terrorism purposes?*

- It makes a difference, but it depends on the ethical limits that may be overrode:
- How far do we go to prevent an attack?
- “It depends on the information is used”.



TABLE 5, Template 2

*As a European funded project, we are not allowed to do military research. However, other research initiatives on the human brain may be funded by defence agencies. It is in general an integrated part of research to collaborate with other researchers in the same field, or at least sharing knowledge and results, in order to move the field/research forward. Should the project collaborate with other brain research initiatives or organisations that work for or receive financial support from defence agencies, e.g. the American “Brain Initiative” or the Chinese “China Brain Project”?*

- Yes (x5)

*Please explain why/why not.*

- “As long as it improved research related to health”.
- “Importance of funds – so sometimes have to collaborate”.
- “Research is always an act of improvement”.
- “Limiting research will not solve anything... defence will get around to do it anyway”.

*Can an organisation receive funding through the Human Brain Project for their civilian research, if they at the same time do military funded research?*

- Yes (x5)

*Please explain why/why not.*

- “Kills two birds with one stone”.
- “As long as you do not share data between clients”.
- “Possibility that some other agencies/ individuals may be doing the research anyway”
- “Better to monitor them”.



TABLE 6, Template 1

*What do you think about the fact that public research intended for civilian use can be used by the military or intelligence agencies?*

- If open it is positive.
- Parameters on the usage of the results should be applied.
- "Defence use is not all negative".
- "All open research is beneficial!"
- "This is always the same with science, the way in which we use it is the most important!"

*Do you find it problematic or reassuring? Please explain (why/why not).*

- "Money power might be problematic"
- "Stopping it is not a solution!".
- "It must be controlled".
- "Ethics should be thought from a young age".
- "Are bodies strong enough to control and stand up against something bad... are we prepared to it?"

*What, if anything, concerns you about the possible use of the research results by the military or intelligence agencies?*

- "the purpose of research".
- "they can start using research on soldiers".
- "the motive of who is using it"
- "outcomes can be used to help on hindering progress for personal gain".
- "eradication of people".

*Does it make a difference if the use of the research by the military or Intelligence agencies is for defence or counter-terrorism purposes?*

- It makes a difference because the concept of "defence" in the EU is different from the one in Asia, Middle East, etc.
- It makes a difference if we lost our natural resources – catastrophic situation (our defence might be different depending on the available conditions).



**TABLE 6, Template 2**

*As a European funded project, we are not allowed to do military research. However, other research initiatives on the human brain may be funded by defence agencies. It is in general an integrated part of research to collaborate with other researchers in the same field, or at least sharing knowledge and results, in order to move the field/research forward. Should the project collaborate with other brain research initiatives or organisations that work for or receive financial support from defence agencies, e.g. the American “Brain Initiative” or the Chinese “China Brain Project”?*

*Please explain why/why not.*

Yes (everyone agrees).

- “We need access to their research as well!”.
- “There is a guarantee that they will use the research correctly!”

□

*Can an organisation receive funding through the Human Brain Project for their civilian research, if they at the same time do military funded research?*

- All participants were positive about this as long as “the collaboration is monitored and people are safeguarded”.

*Please explain why/why not.*

- Whether we like it or not it should be used.



## Annex 2 – Translated templates from round 2

TABLE 1, Medicine

*What are the positive aspects of this development?*

- Chemical weapons could be less aggressive.
- Better medicine if we study the brain more.
- The brain is so powerful that we have to continue studying it.
- More focused research on Bi-polar, Alzheimer's etc.
- More research into how chemicals affect the brain, e.g. Mobile radiation.
- More research on how the brain helps people get better.

*What are the negative aspects of this development?*

- If we learn how to cure depression, we can learn how to cause it.
- This research could be used for manipulation.
- This research could be used to control democratic processes and also to brainwash people.

*What kind of dilemmas will this development cause?*

- Human testing
- Ethics
- Who will get the treatment first?
- Are we creating new diseases?
- Who will get the personalised medicine first?
- New labelling of children- ADHD etc.

*Do the positive aspects outweigh the negative? Or vice versa?*

- 5 positive
- 0 negative

*Are you concerned that this kind of research/development is carried out?*

- 4 "yes"
- 1 "no"

*What are the positive aspects of this development?*

- It all boils down to the way it's used.
- Improvement is always good.
- Efficiency
- Precision
- New solutions
- Earlier diagnosis



*What are the negative aspects of this development?*

- Inducing illness for potential pharmaceutical companies to become billionaires.
- Synthetic drugs
- Enforcement – like doping athletes, pushing limits etc.
- The unknown long-term effects.

*What kind of dilemmas will this development cause?*

- Killing ourselves until we see the side effects.
- Solving one problem and creating another.
- Are we questioning what they are giving us?
- Personal volition (for example: soldiers in combat)

*Do the positive aspects outweigh the negative? Or vice versa?*

- 6 positive answers.

*Are you concerned that this kind of research/development is carried out?*

- All the six participants were directly positively concerned.



**TABLE 3, Medicine**

*What are the positive aspects of this development?*

- More accurate diagnosis.
- More information about different illnesses.
- All knowledge is positive.

*What are the negative aspects of this development?*

- Medical solutions could have positive effects but fall in the wrong hands.
- Removing emotions.
- Dehumanisation.
- Misuse.

*What kind of dilemmas will this development cause?*

- Intentions
- Ethical formation
- Usage by whom
- To what extent

*Do the positive aspects outweigh the negative? Or vice versa?*

- Positive (x3)
- Balanced (x3)
- Negative (0)

*Are you concerned that this kind of research/development is carried out?*

- Concerned (0)
- Not concerned (x5)
- Balanced (x1)



TABLE 4, Medicine

*What are the positive aspects of this development?*

- More predictability;
- Personalisation of treatments;
- Lower combat casualties;
- The multitude of diseases that have the potential to be treated.

*What are the negative aspects of this development?*

- Knowledge about preventing can sadly be perverted to increase one's ability to cause or worsen such afflictions.
- Excessive medicines may lead to abuse, leading humans to live only on medicine.
- It may be all about business development and less about the human quality of life.

*What kind of dilemmas will this development cause?*

- More negative impact
- Mixed feelings

*Do the positive aspects outweigh the negative? Or vice versa?*

- The group expressed mixed feelings in regards to this this.

*Are you concerned that this kind of research/development is carried out?*

- "Slightly concerned".
- "Sceptical about this situation".



TABLE 1, Artificial Intelligence

*What are the positive aspects of this development?*

- Improves the quality of life in patients.
- Improves the quality of life in the elderly.
- It could prevent wars.
- Easy access to information.
- Less time consuming.

*What are the negative aspects of this development?*

- The information may fall in the wrong hands.
- Dystopia where robots take over.
- Unethical uses.

*What kind of dilemmas will this development cause?*

- Ethical issues.
- Becoming dehumanised + heavily reliant on it.
- Dependence that strips emotions.

*Do the positive aspects outweigh the negative? Or vice versa?*

- 50/50
- "We are already dependent on Artificial intelligence".

*Are you concerned that this kind of research/development is carried out?*

- Yes
- "We are concerned but we are helpless".



TABLE 2, Artificial Intelligence

*What are the positive aspects of this development?*

- Efficiency
- Helping humans
- Improving science
- Emotionally humans may be biased.
- Easily to find.

*What are the negative aspects of this development?*

- Losing jobs.
- Reduction in humanity.
- Can be misused by government and military.
- Instant gratification.

*What kind of dilemmas will this development cause?*

- Lack of regulations
- What will happen with the human life?
- When do we stop?
- We might have to rethink the wages due to people being out of jobs.
- Less human interference
- Less rewarding when we do things.

*Do the positive aspects outweigh the negative? Or vice versa?*

- Mostly positive but if misused it will be a catastrophe.

*Are you concerned that this kind of research/development is carried out?*

- Concerned since we have no control.
- Always depends on how it is used.
- Good to be concerned as it means that we are aware.



TABLE 3, Artificial Intelligence

*What are the positive aspects of this development?*

- Improves human life through the increase in intelligent systems such as cleaning assistance and logistical aid.
- Computer intelligent systems remove human error.

*What are the negative aspects of this development?*

- Laziness
- "Too much supervision".
- "Lack of human control".

*What kind of dilemmas will this development cause?*

- War
- Threats against humans
- Lack of empathy
- Final decisions made without morality.

*Do the positive aspects outweigh the negative? Or vice versa?*

- The group did not feel any strong opinion on this topic, rather feeling split between good and bad.

*Are you concerned that this kind of research/development is carried out?*

- The group felt rather concerned about what the future held but at the same time were excited about future developments.



**TABLE 4, Artificial Intelligence**

*What are the positive aspects of this development?*

- Mankind gaining more knowledge about mankind.
- Help humans where physically limited.
- Going beyond human limitations
- Not biased
- Not run by emotions
- More humans overseeing robots, e.g. Surgeon.

*What are the negative aspects of this development?*

- Loss of jobs
- Glitches in artificial intelligence could lead to disastrous consequences.
- No longer appreciating our own humanity.

*What kind of dilemmas will this development cause?*

- Main intentions.
- Bias

*Do the positive aspects outweigh the negative? Or vice versa?*

- Positive (x3)
- Negative (x 1)
- Neutral/balanced (2)

*Are you concerned that this kind of research/development is carried out?*

- Yes (0)
- No (x 6)
- Neutral/balanced (0)



**TABLE 1, Brain-computer interfaces**

*What are the positive aspects of this development?*

- Medical wise.
- Advances in lifestyles.
- Extend mental/human capability.
- Technology that is immersive and interactive.

*What are the negative aspects of this development?*

- Health-wise – radiation.
- Invasion of privacy.
- Manipulation of thought process.
- Addiction
- Politically/military exploitation.

*What kind of dilemmas will this development cause?*

- Survival of the fittest
- Dilemma controlling energies
- Will we manage to control what we created?
- Changing our values – privacy as interpreted by people who lived in a world without social media, so they may be naive in their approach.

*Do the positive aspects outweigh the negative? Or vice versa?*

- Positive (x3)
- Negative (x2)

*Are you concerned that this kind of research/development is carried out?*

- Research is essential.
- Honesty
- Ethical standards.
- Importance of education and awareness.

**TABLE 2, Brain-computer interfaces**

*What are the positive aspects of this development?*

- Funds allocated to positive issues- such as giving vision to blind people.
- Less loss of life.
- Amputees regaining limbs.
- Communicating with coma patients.
- Adding more functions.

*What are the negative aspects of this development?*

- Invasive
- Big brother watching
- We can lose our basic human senses.
- Unfair advantage in military usages.
- Lack of originality if it had to take over.

*What kind of dilemmas will this development cause?*

- Is the society ready for such progress?
- The gap will keep getting wider.
- Dilemma of control.
- Will we become killing machines?
- Is it taking over our emotions?
- Over population
- Ethics.

*Do the positive aspects outweigh the negative? Or vice versa?*

- Even though all the above, the whole group agreed that this development is positive.

*Are you concerned that this kind of research/development is carried out?*

- Yes (x2)
- No (x3)

**TABLE 3, Brain-computer interfaces**

*What are the positive aspects of this development?*

- Can help a lot of people.
- Even military application can be positive.
- A good revolution.

*What are the negative aspects of this development?*

- Sometimes they are gimmick.
- The fact that one can play with memory.
- It can manipulate people.
- Can it have an impact on the personal?
- Loss of privacy.

*What kind of dilemmas will this development cause?*

- When to stop?
- To who will this be available?
- Costs
- Level of power.

*Do the positive aspects outweigh the negative? Or vice versa?*

- For now, more positive than negative.

*Are you concerned that this kind of research/development is carried out?*

- Having a full army with computer brains.
- Regulation
- The consent of the respective person.
- Interfering with nature will always be a repercussion.

**TABLE 4, Brain-computer interfaces**

*What are the positive aspects of this development?*

- Medical use such as spinal and neural cures.
- Improved methods of education.

*What are the negative aspects of this development?*

- Possibility of someone else controlling you.

*What kind of dilemmas will this development cause?*

- Technology taken too for granted.
- The threat of 'super soldiers'.
- Hacked systems and viruses.

*Do the positive aspects outweigh the negative? Or vice versa?*

- The group felt slightly more positive towards this topic.

*Are you concerned that this kind of research/development is carried out?*

- The group was happy that this research is being carried out but was also concerned about who was conducting it and for what purpose.



## Annex 3 – Translated templates from round 3

Themes suggested by the group	Policy-makers	Researchers	Stakeholders	Citizens
<b>Ethics</b>	3)When should quality of life overrule quantity of life, and when should one draw a line? <b>11</b>	2)How can research findings be limited for ethical use? <b>8</b>		1)Who would be responsible to draw the line or shut down research if it starts to cross over dangerous boundaries? <b>5</b>
<b>Education</b>	4)How can we ensure that the advances in neuroscience are accompanied by investment in education and ethical studies? <b>15</b>		4)How can we ensure that the advances in neuroscience are accompanied by investment in education and ethical studies?	
<b>Funding</b>		10)What is the objective and what are your priorities about the human being? On whom are you testing your product? Are you being funded by 3 <sup>rd</sup> parties? Who are they? <b>3</b>		
<b>Medicine</b>	6)What can be done with regards to legalisation of marijuana more worldwide, and what can be done about the 'redtape'? <b>5</b>	11) Who gets to choose what population gets chosen for a particular type of trial? <b>1</b>		
<b>Military</b>	5)How are you drawing up controls? Would you be open up this research for the military and if you intend to , what parameteres are you putting up? <b>4</b>			
<b>Legal and control</b>		7)What can be done for people who are less minded and what can be made to stop brain washing? <b>2</b>	8)How are you ensuring that you do not manipulate any decisions that might not leave the human as the most important element of all research? <b>4</b>	9)Do you know what rights you have? Do you feel that research is taking up any of your privacy or your life? <b>6</b>



**TABLE 2, Template 6**

Themes suggested by the group	Policy-makers	Researchers	Stakeholders	Citizens
<b>Holistic Education / Ethics</b>	<p>1) Will the European Communities still be willing to fund such development if there was no money making involved? Would not it be more ethical is the citizens were to be given more holistic education about the matter rather than just academic?</p> <p>22</p>	<p>Will the European Communities still be willing to fund such development if there was no money making involved? Would not it be more ethical is the citizens were to be given more holistic education about the matter rather than just academic?</p>	<p>Will the European Communities still be willing to fund such development if there was no money making involved? Would not it be more ethical is the citizens were to be given more holistic education about the matter rather than just academic?</p>	<p>Will the European Communities still be willing to fund such development if there was no money making involved? Would not it be more ethical is the citizens were to be given more holistic education about the matter rather than just academic?</p>
<b>Education</b>	<p>2) More education to teach people in terms of technology, teach children reality and parents on how to be more responsible for their children.</p> <p>4</p>	<p>6) Can children be educated how to play with technology? It seems like we are feeding a monster called addiction instead of health brains.</p> <p>8</p>		
<b>Local funding</b>	<p>3) What funding is being given for Parkinson's and Alzheimer's. Is the proposed treatment in the research available in Malta?</p> <p>2</p>	<p>3) What funding is being given for Parkinson's and Alzheimer's. Is the proposed treatment in the research available in Malta?</p>	<p>3) What funding is being given for Parkinson's and Alzheimer's. Is the proposed treatment in the research available in Malta?</p>	
<b>Medicine</b>	<p>4) Can there be more research to cure disease? To facilitate people's life and less research to destruct the population?</p> <p>15</p>			
<b>Medicine</b>	<p>5) What is being made to enhance the daily living/ future of persons with neurological conditions and autism to calm down impulses naturally and focus more on their abilities and potentials without the use of chemicals?</p> <p>9</p>			



**TABLE 3, Template 6**

Themes suggested by the group	Policy-makers	Researchers	Stakeholders	Citizens
<b>Ethics</b>	1) Who is going to enforce ethical regulations and access? <b>13</b>		8) How can we be sure that there will be no repercussions from the outcomes? Avoiding a big brother scenario <b>14</b>	
<b>Consent</b>	6) Who is the ultimate beneficiary? <b>1</b>	3) What measures are researchers taking when it comes to safety during the process of testing? <b>13</b>	7) Who will have access to the research made? Will it be freely available to the public or sold to the private companies and marketed to end-products? <b>4</b>	2) How willing are you to attach a permanent implant to your brain, if it means it can release limb functionality and improve brain performance, but at the expense of unknown side effects? <b>5</b>
<b>Artificial Intelligence</b>	4) Who will make sure that the initial data does not contain bias? <b>3</b>	5) Who has access to the technologies that are created? <b>6</b>		



**TABLE 4, Template 6**

Themes suggested by the group	Policy-makers	Researchers	Stakeholders	Citizens
<b>Ethics/Transparency/</b>	1)How could block chain technology be incorporated with the aim of ensuring transparency, promoting accountability and ethical furtherance application of research and technology? <b>3</b>		How could block chain technology be incorporated with the aim of ensuring transparency, promoting accountability and ethical furtherance application of research and technology?	
<b>Transparency</b>	2)Are there enough regulations regarding the ethical aspect of artificial intelligence and medication? <b>12</b>	Are there enough regulations regarding the ethical aspect of artificial intelligence and medication?		
<b>Education</b>	3)Research into the educational system so that from an early age the child adapts to think for himself/herself rather than indoctrinate with knowledge, the child is thought skills and values so that they are better equipped to use artificial intelligence responsibly without being impressionable. <b>9</b>	Research into the educational system so that from an early age the child adapts to think for himself/herself rather than indoctrinate with knowledge, the child is thought skills and values so that they are better equipped to use artificial intelligence responsibly without being impressionable.	Research into the educational system so that from an early age the child adapts to think for himself/herself rather than indoctrinate with knowledge, the child is thought skills and values so that they are better equipped to use artificial intelligence responsibly without being impressionable.	Research into the educational system so that from an early age the child adapts to think for himself/herself rather than indoctrinate with knowledge, the child is thought skills and values so that they are better equipped to use artificial intelligence responsibly without being impressionable.
<b>Non dependency</b>			How will you ensure that you will retain a degree of independence, or at least non-dependence upon research + technology that result? <b>2</b>	
<b>Political</b>	4)How can researchers guarantee that our civil rights are safeguarded while nowadays research is such important? <b>14</b>	How can the results that come out of a study be safeguarded for good use? <b>21</b>		



**TABLE 5, Template 6**

Themes suggested by the group	Policy-makers	Researchers	Stakeholders	Citizens
<b>Medical cure</b>	<p style="text-align: right;"><b>5</b></p> <p>1) Could there be an overall solution to brain illnesses, such as music etc.?</p>	<p>Could there be an overall solution to brain illnesses, such as music etc.?</p>	<p>Could there be an overall solution to brain illnesses, such as music etc.?</p>	
<b>Research</b>	<p style="text-align: right;"><b>19</b></p> <p>2) Who/ what regulates usage, intention, results, products algorithms, methods, dosage.</p>	<p style="text-align: right;"><b>9</b></p> <p>3) Will the research (HBP) be accessible and free for all?</p>	<p>Who/ what regulates usage, intention, results, products algorithms, methods, dosage.</p>	
<b>Funding</b>	<p style="text-align: right;"><b>21</b></p> <p>4) Can you ensure that findings for this project comes from an ethical source which has no negative bias?</p>			
<b>Medicine</b>		<p style="text-align: right;"><b>6</b></p> <p>5) What kind of treatment, side-effects does medicine have? How long will it take to be minimised?</p>	<p>What kind of treatment, extent, side-effects does medicine have? How long will it take to be minimised?</p>	



**TABLE 6, Template 6**

Themes suggested by the group	Policy-makers	Researchers	Stakeholders	Citizens
<b>Brain Computer Interfacing</b>		1)As regards to BCI, is the intention to supress human emotion? <b>1</b>		
<b>Artificial intelligence</b>			2)Are you ready to take orders from a robot with Artificial intelligence at your place of work? <b>1</b>	
<b>Medical</b>	3)What is the aim of this research to improve my wellbeing towards neuroscience development? <b>13</b>			
<b>Artificial Intelligence</b>		4)Who will switch off the supply to all robots? <b>5</b>		
<b>Medical / BCI</b>	5)How will robotic aids be made available to those in need? Will they only be available to those who can afford it? <b>12</b>			
<b>BCI</b>		6)Will the financial backers of the BCI project pledge to publish all data which will help improve human life and not hinder it? <b>5</b>		
<b>Medical</b>	7)Knowing that high precision medicines would produce fewer side effects, will the governments finance thee medicines to help all and not only those who can afford? <b>2</b>			
<b>Policy</b>	8)What checks are in place or will be put into place to counter systems or sense users with malicious intentions? <b>21</b>			



## Annex 4 – Results from morning survey

### QUESTIONNAIRE ON NEUROSCIENCE AND DUAL USE

(mark the answers that you agree with the most with an X)

- 1) Does it make you concerned that the research from the Human Brain Project could be used by others for political, security, intelligence and military purposes? (choose one option)

Not concerned at all	Slightly concerned	Moderately concerned	Somewhat concerned	Extremely concerned
7	5	6	8	6

- 2) If publicly funded research has dual use potential, should it then be allowed? (choose one option)

a. Yes	28
b. No	2
c. I don't know/do not wish to answer	2

- 3) As a European funded project, we are not allowed to do military research. However, other research initiatives on the human brain may be funded by defence agencies. Should the project collaborate with other brain research initiatives or organisations that work for or receive financial support from defence agencies e.g. the American "Brain Initiative" or the Chinese "China Brain Project"? (choose one option)

a. Yes, the most important thing is to make progress in the research.	12
b. Yes, but only if it is based in another EU member state.	2
c. Yes, but only if it is based in an allied country of the European Union	1
d. Yes, but only initiatives or organisations in countries, who have signed and ratified international treaties on e.g. chemical or biological weapons	13
e. No, the research project should not collaborate with initiatives or organisations funded by military or defence agencies.	4
f. I don't know/do not wish to answer	0

- 4) The European Commission has a big focus on open science, where research data and analyses are public for everyone. Should this also be the case with research that could have dual use potential? (choose one option)

a. Yes	24
b. No	3
c. I don't know/do not wish to answer	5



## Annex 5 – Results from afternoon survey

### QUESTIONNAIRE ON NEUROSCIENCE AND DUAL USE

*(mark the answers that you agree with the most with an X)*

- 1) Does it make you concerned that the research from the Human Brain Project could be used by others for political, security, intelligence and military purposes? *(choose one option)*

Not concerned at all	Slightly concerned	Moderately concerned	Somewhat concerned	Extremely concerned
7	6	5	8	6

- 2) If publicly funded research has dual use potential, should it then be allowed? *(choose one option)*

a. Yes	19
b. No	5
c. I don't know/do not wish to answer	8

- 3) As a European funded project, we are not allowed to do military research. However, other research initiatives on the human brain may be funded by defence agencies. Should the project collaborate with other brain research initiatives or organisations that work for or receive financial support from defence agencies e.g. the American "Brain Initiative" or the Chinese "China Brain Project"? *(choose one option)*

a. Yes, the most important thing is to make progress in the research.	12
b. Yes, but only if it is based in another EU member state.	1
c. Yes, but only if it is based in an allied country of the European Union	0
d. Yes, but only initiatives or organisations in countries, who have signed and ratified international treaties on e.g. chemical or biological weapons	13
e. No, the research project should not collaborate with initiatives or organisations funded by military or defence agencies.	5
f. I don't know/do not wish to answer	0

**Note:** One of the participants forgot to provide an answer to this question.

- 4) The European Commission has a big focus on open science, where research data and analyses are public for everyone. Should this also be the case with research that could have dual use potential? *(choose one option)*

a. Yes	21
b. No	5
	6



c. I don't know/do not wish to answer