Department of Health & Social Care

ISOU Xenotransplantation Sub-group Recommendations

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Contents

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Glossary and abbreviations

ATMP – Advanced Therapy Medicinal Products

CRISPR – Clustered Regularly Interspaced Short Palindromic Repeats – gene editing technology

DEFRA – Department for Environment, Food and Rural Affairs

EU – European Union

HTA – Human Tissue Authority

ISOU – Implementation Steering group for Organ Utilisation

IXA – International Xenotransplantation Association

MHRA - Medicines and Healthcare products Regulatory Agency

NIHR – National Institute of Health Research

Pathogens – micro-organisms that can cause infections or diseases (e.g. viruses, bacteria)

PERV – Porcine Endogenous Retro Virus

PIRU – Policy Innovation and evaluation Research Unit

Porcine – of pig origin

UKRI – UK Research and Innovation

Xenotransplantation – Transplantation of cells, tissues or organs from animals into humans (e.g. pig organ transplanted into a human)

Zoonoses – infections or diseases transmitted from non-human animals to humans

Co-chair’s introduction

ISOU Xenotransplantation sub-group Co-chair’s introduction

Since 2022, reports from the USA on the first short-term successful heart and kidney xenotransplants in patients, using organs derived from genetically engineered pigs, generated considerable interest amongst patient and clinician communities, the media and the public at large. The promise of xenotransplantation to be a disruptive technology to benefit patients is matched by considerable challenges, necessitating careful and comprehensive planning to ensure patient (and wider public) safety.

These comments notwithstanding, it is possible/probable that xenotransplantation may become available in the foreseeable future, and that products containing xenotransplant material, such as liver assist devices, may reach a stage of technical maturity ahead of whole organ xenotransplantation.

The ISOU Xenotransplantation sub-group approached its mandate, that of understanding what would be necessary for the introduction of this biotechnology to the UK, by reviewing the entire landscape, from legislation to research. The group conducted its work by consulting widely and we were greatly assisted by generous input from national and international experts on subjects from animal welfare to the basic biology of xenotransplantation.

We are very grateful for the enthusiastic and open participation from all the sub-group members. Despite the varied fields of expertise represented, the group gelled well around the common purpose focussed on safety and the needs of patients and their families, as well as the safety of wider citizens in the UK and important ethical considerations raised by this biotechnology. This sense of common purpose allowed the group to transparently share and listen to varied viewpoints, trust expert input, ensure inclusivity, and be prepared to reach a consensus. This made our role as co-chairs enjoyable, fascinating and a learning experience.

On behalf of all members of the Xenotransplantation sub-group, we offer our thanks to ISOU co-chairs William Vineall and John Forsythe and to DHSC colleagues Helen McDaniel, Michael Hopkinson and Samantha West, for their help and support to enable the sub-group to discharge its functions.

John Iredale and Anthony Clarkson

Executive Summary

Despite policy initiatives and best efforts to improve organ donation, there continues to be a worldwide demand-supply gap between patients waiting for organ transplants and availability of donated human organs. Every year, approximately 400-500 patients on organ transplant waiting lists in the UK die due to non-availability of organs. These challenges have spurred long standing endeavours to define alternative sources of organs, including organs from animals. The transplantation of organs (or cells, or tissues) from one animal species into a different animal species, including into humans, is referred to as Xenotransplantation (XT).

The United Kingdom (UK) was at the forefront of XT research and public policy development during the 1990s. This included the publication of the Kennedy report[1] (1996), the Nuffield Council of Bioethics publication (1996), and the establishment of the UK Xenotransplantation Interim Regulatory Authority in 1997. However, scientific and other hurdles resulted in the cessation of XT related activity in the UK over the last twenty years and no xenotransplants have been performed in the UK to date.

Recent advances in genomics technology, especially gene editing technology (e.g. CRISPR), resulted in a step change in bringing XT closer to clinical use. Since 2022, multiple reports have emerged from the USA on the short-term (each circa 60 days) successful XT of whole organs (hearts and kidneys) from genetically edited pigs into patients. These transplants demonstrated that some of the major previous scientific hurdles of XT had been crossed but they also identified new challenges. Furthermore, products which use XT material (e.g. cells) may become available for clinical application whilst the scientific hurdles related to whole organ XT are still being addressed.

Recognising recent significant technological advances, and in line with the Implementation Steering group for Organ Utilisation (ISOU) recommendation 9 (“evaluating and embracing innovation that could improve outcomes for patients”); the ISOU XT advisory group was set up with the mandate to evaluate and make recommendations relevant to this technology in the UK. The group consisted of lay members, patients, and experts in ethics, law, zoonoses (infections transmitted from animals to humans), animal welfare, research and regulation. The group was joined by international observers from the EU, Australia and New Zealand to facilitate shared learning.

The ISOU XT advisory group, with input from relevant members within the group and invited external subject matter experts, addressed its mandate through detailed

[1] Animal Tissue into Humans: A Report by the Advisory Group on the Ethics of Xenotransplantation, (Department of Health, 1996)

discussions at theme specific meetings. The group also held engagement sessions with a diverse focus group of lay people and with current leading providers of this technology from the USA and Germany. In parallel, the National Institute of Health Research (NIHR) funded Policy Innovation and evaluation Research Unit (PIRU) undertook the largest known survey in Europe of public attitudes to XT in the UK. This showed that the majority of the surveyed population supported the evaluation of XT with appropriate safeguards. With this rich and varied input, the advisory group was able to draw theme specific recommendations.

The advisory group's recommendations reflect how XT (from pigs as source animals) could be part of the suite of solutions to address the current demand-supply gap in organ and tissue transplantation but also the need for safe and robust systems to introduce and evaluate this biotechnology in the UK.

Theme 1: UK legislative framework to enable xenotransplantation

Recommendation 1: The 2006 DH guidance on Xenotransplantation (XT) is restored and updated to provide the legislative framework for XT in the UK. The definition of XT in the 2006 DH guidance is retained.

Recommendation 2: If live animals used for XT product procurement are based in the UK, the Animal (Scientific Procedures) Act 1986 is utilised as the legislative framework to ensure necessary safety and animal welfare provisions. If source animals are not based in the UK, procurement commissioning to ensure providers meet UK animal welfare standards.

Theme 2: UK regulatory framework to regulate xenotransplantation

Recommendation 3: Xenotransplantation is classed as an Advanced Therapy Medicinal Product (ATMP) and is subject to regulation applicable to ATMPs by the Medicines and Healthcare products Regulatory Agency (MHRA) as the lead regulator. The MHRA should be appropriately resourced to undertake this new activity.

Theme 3: Ethical aspects of xenotransplantation

Recommendation 4: Ethical guidance for XT is revised in light of evolving social and clinical perspectives and scientific advancements. As the publishers of the original definitive review, the Nuffield Council on Bioethics is invited to update their 1996 publication on the ethics of XT.

Theme 4: Zoonoses (infections or diseases transmitted from animals to humans) related to xenotransplantation

Recommendation 5: Xenotransplant products used in the UK are derived from animals that have been fully characterised for endogenous and exogenous pathogens of concern.

Recommendation 6: The capability and capacity for validated testing of known and emerging zoonoses in human recipients of XT (and their contacts) is established in the UK. Similar testing infrastructure should extend to testing source animals for pathogens of concern if live animals used for XT organ procurement are based in the UK. Procurement commissioning to apply the same testing standards if source animals are not in the UK.

Theme 5: UK research in xenotransplantation

Recommendation 7: Xenotransplantation in the UK is initially undertaken only within a clinical trial framework and only in adults (aged >16 years). Extension of trial eligibility to paediatric (<16 years) patients is considered only after safety and efficacy is established in adults. The trial design must include health economic and impact assessments.

Recommendation 8: A constellation of interlinked and inter-disciplinary research answering questions relating to XT that are of importance to patients, the public, clinicians and policy makers should come together as a programme of research and be advanced to the point of being fundable by UK Research and Innovation (UKRI) and National Institute of Health Research (NIHR). Where possible, UK research initiatives to collaborate with similar initiatives in the EU and elsewhere.

Recommendation 9: The NIHR/Policy Innovation and evaluation Research Unit (PIRU) to prioritise conducting a survey exploring patient attitudes, particularly patients on organ transplant waiting lists, to XT.

Theme 6: Leadership and coordination of xenotransplantation activity in UK

Recommendation 10: The DHSC establishes a time-limited Advisory Committee to advise UK Ministers and Health Departments (and, where relevant, other Departments, e.g. DEFRA) to ensure the coordinated and safe introduction of XT in the UK.

Theme 1 – UK legislative framework to enable xenotransplantation

Recommendation 1: The 2006 DH guidance on Xenotransplantation (XT) is restored and updated to provide the legislative framework for XT in the UK. The definition[2] of XT in the 2006 DH guidance is retained.

Recommendation 2: If live animals used for XT product procurement are based in the UK, the Animal (Scientific Procedures) Act 1986 is utilised as the legislative framework to ensure necessary safety and animal welfare provisions. If source animals are not based in the UK, procurement commissioning to ensure providers meet UK animal welfare standards.

Xenotransplantation is a reserved matter and policy responsibility is retained by the UK Parliament at Westminster. A robust legislative framework to guide and support the introduction of XT in the UK is essential for the assurance and protection of the population in general and patients in particular. Such a framework is also necessary to guide practice of any future regulators and providers of XT in the UK.

The advisory group concluded that the 2006 DH guidance on XT satisfied many of the requirements to ensure the safety of patients and the public, the provision of clear guidance to providers and alignment with the group's other recommendations (e.g. on regulation). The definition of XT, as well as other guidance (e.g. on regulation) in the document aligned with definitions and guidance in the USA, the EU and other countries. Retaining the definition and much of the existing guidance also reduces the risk of misalignment with the Northern Ireland protocol/Windsor framework and permits a common arrangement across all four UK nations. Some revision and updating of the guidance will be required (e.g. removing references to Gene Therapy Advisory Committee, the Health Protection Agency).

Providers of source animals used to derive products (cells, tissues or organs) for XT may site the animal facilities in the UK or elsewhere and import the medicinal product (i.e. only the cells or tissues or organs are imported).

If the source animals are housed in the UK, the advisory group concluded that adherence to the animal welfare standards as set out in the Animal (Scientific Procedures) Act 1986 provided the appropriate legal framework and would provide assurance to relevant

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[2] Xenotransplantation shall mean any procedure that involves the transplantation, implantation, or infusion into a human recipient of either live tissues or organs retrieved from animals, or, human body fluids, cells, tissues or organs that have undergone ex vivo contact with live non-human animal cells, tissues or organs.

stakeholders. Provided that the Animal (Scientific Procedures) Act 1986 is complied with, the provisions of Animal Welfare Act 2006 are unlikely to be breached.

Confirmation has been sought and obtained from DEFRA that Genetically Modified Organism (GMO) regulations, as defined in section 106 of the Environmental Protection Act 1990 (as amended), and techniques of genetic modification, as set out in regulation 5 of the Genetically Modified Organisms (Deliberate Release) Regulations 2002 (SI 2002/2443) (as amended), would apply if live source animals were in the UK. It has also been confirmed that the Genetic Technology (Precision Breeding) Act 2023 would not apply to animals bred for the purposes of XT in humans.

Theme 2 – UK regulatory framework to regulate xenotransplantation

Recommendation 3: Xenotransplantation is classed as an Advanced Therapy Medicinal Product (ATMP) and is subject to regulation applicable to ATMPs by the Medicines and Healthcare products Regulatory Agency (MHRA) as the lead regulator. The MHRA should be appropriately resourced to undertake this new activity.

The public attitude survey undertaken for this advisory group, stakeholder engagement and advisory group deliberations have all indicated a strong and unified need for a clear, trusted and robust regulatory process to oversee XT and assure policy makers, public and patients in the UK.

Under existing legislation, the MHRA currently regulates drugs and devices, including cells and tissues even if they are of animal origin and the Human Tissue Authority (HTA) regulates use of organs and tissues derived from humans. Current legislation does not cover the use of whole organs derived from animals, including genetically modified animals, resulting in lack of clarity on regulatory oversight. The Human Tissue Act 2004, as the underpinning legislation for HTA as a regulator for transplantation, does not cover cells/tissues/organs from non-human sources.

The Food and Drug Administration (FDA) in the USA and the European Medicines Agency (EMA) categorise cells, tissues and organs from non-human sources as ATMP and regulate XT in their jurisdictions. The 2006 DH guidance on XT categorises XT as an ATMP and consequently the MHRA as the regulator for this activity. To enable alignment with the 2006 DH guidance on XT, derive the benefits of a single (or lead) regulator for all predicted types of XT activity (cells, tissues, organs and perfusion of human blood outside the body through xeno organs) and alignment with regulation in the EU and USA, the advisory group concluded that XT continues to be classified as ATMP and the MHRA is the lead regulator for this activity.

The advisory group recognised that XT is a novel technology and the MHRA will require access to appropriate expertise and additional resources and/or partnership with other regulators (e.g. the HTA) to comprehensively regulate this new activity. Collaboration between lead regulators across USA, EU and other countries is also deemed essential as recipients of XT may travel between jurisdictions.

Theme 3 – Ethical aspects of xenotransplantation

Recommendation 4: Ethical guidance for XT is revised in light of evolving social and clinical perspectives and scientific advancements. As the publishers of the original definitive review, the Nuffield Council on Bioethics is invited to update their 1996 publication on the ethics of XT.

The 1996 publication on the ethics of XT by the Nuffield Council on Bioethics was recognised internationally as the definitive review on the subject at that time. The publication also guided subsequent policy development and potential implementation options. Whilst many of the principles set out in the 1996 publication continue to apply, science, society and clinical practice have evolved in the intervening period in ways relevant to ethical considerations XT. The Nuffield Council on Bioethics continues to be viewed as the premier institution with relevant expertise to review and update the 1996 publication, with the review being essential to guide all stakeholders.

Theme 4 – Zoonoses (infections transmitted from animals to humans) related to xenotransplantation

Recommendation 5: Xenotransplant products used in the UK are derived from animals that have been fully characterised for endogenous and exogenous pathogens of concern.

Recommendation 6: The capability and capacity for validated testing of known and emerging zoonoses in human recipients of XT (and their contacts) is established in the UK. Similar testing infrastructure should extend to testing source animals for pathogens of concern if live animals used for XT organ procurement are based in the UK. Procurement commissioning to apply the same testing standards if source animals are not in the UK.

Zoonoses are infections or diseases transmitted from animals to humans. In XT there is a risk of transmission of infections from source animals to the human recipient of the organ, tissue or cells, and this is a source of concern to patients, close contacts/family of patients (if the infection spreads from patient to the family member/s), clinicians and the wider population.

The infectious agents of concern are broadly divided into two categories (1) endogenous infectious agents that are in the genetic code in the source animal and in the case of pigs they are called Porcine Endogenous Retro Virus (PERV) (2) exogenous infectious agents resulting from infection from other animals – these include viruses, bacteria, fungi and parasites.

With respect to endogenous retroviruses, three main sub-types of PERVs have been described – PERV-A, PERV-B and PERV-C, and finally the occurrence of PERV-AC recombination in certain pig breeds. All known pig species have PERV-A and PERV-B, whereas some pig populations occurring naturally or by selective breeding can be PERV-C free. There has been no evidence of transmission of PERVs from pigs to humans, despite close association for many centuries and following xenotransplants performed to date. Currently, there is the proven ability to generate PERV inactivated animals via targeted genetic editing. Even though there have been no recorded cases of transmission of PERVs to humans, the advisory group concluded that XT in the UK should be performed using animals where PERV is fully characterised.

A number of exogenous viruses, bacteria, fungi and parasites are normally found in all animals including pigs. Whilst such organisms may not be harmful to their primary host, if transmitted to humans they may cause illness. The organisms that are relevant to XT have been studied and characterised by expert groups[3]. Surveillance testing for such organisms in the pig and for infections in the human recipients (and their contacts) of such organs is essential to ensure that XT is safe.

Due to the novel nature of the possibility of infections of porcine (pig) origin, testing for some of these pathogens is not validated for human XT recipients. The UK has the relevant expertise within organisations such as the UK Health Security Agency (UKHSA), academic institutions and industry partners to develop, validate and obtain regulatory approval for the required testing protocols. The capacity and capability to have such testing infrastructure in the UK is key to enable the safe practice of XT. The capability and capacity to test source animals for relevant pathogens will also be needed if such animals are based in the UK.

[3] Groenendaal H and others. 'Expert opinion on the identification, risk assessment, and mitigation of microorganisms and parasites relevant to xenotransplantation products from pigs' Xenotransplantation. 2023 (viewed on 28/01/2025)

Theme 5 – UK research in xenotransplantation

Recommendation 7: Xenotransplantation in the UK is initially undertaken only within a clinical trial framework and only in adults (aged >16 years). Extension of trial eligibility to paediatric (<16 years) patients is considered only after safety and efficacy is established in adults. The trial design must include health economic and impact assessments.

Recommendation 8: A constellation of interlinked and inter-disciplinary research answering questions relating to XT that are of importance to patients, the public, clinicians and policy makers should come together as a programme of research and be advanced to the point of being fundable by UK Research and Innovation (UKRI) and National Institute of Health Research (NIHR). Where possible, UK research initiatives to collaborate with similar initiatives in the EU and elsewhere.

Recommendation 9: The NIHR/Policy Innovation and evaluation Research Unit (PIRU) to prioritise conducting a survey exploring patient attitudes, particularly patients on organ transplant waiting lists, to XT.

Xenotransplantation is a novel and exciting biotechnological advance with the potential to revolutionise health outcomes for selected patients. However, this technology also presents several currently unanswered challenges from both clinical and societal perspectives. Patient selection, health (physical and mental) and quality of life outcomes important to patients and clinicians, ideal drug combinations to prevent rejection, infection management and cost effectiveness are all amongst the factors yet to be fully understood for XT. A clinical trial framework provides the safest and most rigorous mechanism to evaluate this novel biotechnology and establish its fit within the wider NHS.

The sub-group recognised the real possibility that urgent requests for compassionate use approval to undertake XT may be sought by UK patients or relatives. These may be in emotionally charged situations, especially if no other immediately lifesaving alternative treatment is currently available, e.g. paediatric heart transplantation due to the relative lack of size matched human deceased donor organs. Despite the difficult decision making required in such circumstances, XT activity undertaken outside structured and protective clinical trial frameworks has a higher risk of adverse events and inability to adequately evaluate outcomes.

The research queries relating to XT span qualitative and quantitative, clinical and basic science, physical and mental health, ethical and utilitarian paradigms. The UK can leverage its existing clinical, academic and healthcare infrastructure strengths to answer such queries conclusively. To deliver this aim, patients, researchers, clinicians and funders will need to collaborate and coordinate not only across all four UK nations, and where possible collaborate with similar programmes in the EU and elsewhere to enable aligned, at scale, cost effective and timely research.

The national survey of public attitudes to XT (Appendix 1) undertaken by PIRU in 2024 is the largest survey to date conducted anywhere in Europe. It was wide ranging and captured the views of a representative sample of more than 3000 people in the UK using a robust, cognitively tested survey instrument. The survey found a high overall level of support for XT, on the basis it could save lives that would otherwise have been lost. The survey showed that the level of support rose when respondents were provided with more information about XT. The survey also highlighted the importance of trust placed on independent oversight (e.g. by MHRA) and the regulation of such activity. The advisory group was reassured by the finding that the overwhelming majority of respondents did not believe that availability of XT would reduce their willingness to consent to organ donation after death and therefore that the introduction of XT in the UK would not reduce the availability of human organs for transplantation. As maybe expected, there were some differences in attitudes and views within the sample (e.g. based on sex, age, dietary habits).

The advisory sub-group prioritised the survey of public attitudes to aid policy decisions as XT potentially has impacts wider than healthcare. A similar survey (possibly complemented by in-depth interviews) of patients, especially patients currently on organ transplant waiting lists, is the critical next step to guide further actions. Given that PIRU has a readily available robust survey instrument and is familiar with deployment and interpretation of findings using this instrument and providing high quality analyses from such surveys, the advisory group concluded that PIRU is either resourced or the DHSC R&D committee prioritises the conduct and report on patient attitudes to XT.

Theme 6 – Leadership and coordination of xenotransplantation activity in UK

Recommendation 10: DHSC establishes a time-limited Advisory Committee to advise UK ministers and health departments (and, where relevant, other departments, e.g. DEFRA) to ensure the coordinated and safe introduction of XT in the UK.

Successful evaluation, and if appropriate, routine implementation of XT to improve outcomes for patients in the UK poses unique opportunities and challenges. It is unlikely that any single governmental committee or organisation within their existing mandate will be able to meet the obligations required to provide coordinated national advice and leadership. This is especially relevant as XT may impact on portfolios spanning multiple Government Departments including DHSC, DEFRA, DWP and the Home Office. The sub-group concluded that a national advisory committee, similar to the Safety of Blood Tissues and Organs (SaBTO), with inter-disciplinary membership and mandated to be the national focal point of XT related activity in the UK, is essential to introduce, evaluate and advise on XT to relevant Ministers and Government Departments.

If approved, such an advisory committee in collaboration with relevant experts, agencies and Government Departments, could lead on implementation of the above recommendations (e.g. recommendation 1 – restoring and updating the 2006 DH guidance recommendation 8 etc).

Appendix 1 – PIRU survey results

Public attitudes and views on xenotransplantation from the first representative United Kingdom sample survey

Mustafa Al-Haboubi, Paul Boadu, Agata Pacho, Antonia Cronin, and Nicholas Mays

With xenotransplantation fast approaching as a possible option for patients waiting for a transplant, it is important for policy makers and clinicians to understand how the public and patients view this prospect. This is currently limited by the dearth of evidence from representative surveys[4]. To this end, we undertook what is, to the best of our knowledge, the largest and most up-to-date survey in Europe of the public's attitudes and views on xenotransplantation.

The study was approved by the London School of Hygiene & Tropical Medicine Research Ethics Committee (Ref: 30797 – 01). Following initial uninformed questions, subsequent survey sections included basic information about the likely way in which xenotransplantation would take place were it to be introduced. It was explained to the respondents that the current focus was on pig-to-human transplants.

After extensive cognitive testing, and consultation with a lay advisory group, our questionnaire was administered online and by phone to a representative sample (in terms of sex, age, education, ethnicity and religion) of the UK adult population drawn from the National Centre for Social Research's probability-based Opinion Panel[5] from 30 August to 29 September 2024 (n=3,193). The response rate was 53% (3,193/6,024).

Sixty-five percent were aware of the possibility of xenotransplantation (figure a). The predominant 'gut reaction' to the possibility was a mix of uncertainty, concern and nervousness (figure b). However, the majority (65%) were supportive in principle (19% responding that it should definitely be permitted and 46% that it should probably be allowed) (figure c). Support was significantly higher among men (74%) than women (57%) and among those self-identifying as White (67%) versus Non-white (54%). The level of support rose after basic information had been provided to respondents.

Among those who thought xenotransplantation should be allowed, the main reason given was to save lives that would otherwise be lost (34%). Among those who thought that xenotransplantation should not be allowed, the main reasons given were that animals

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[4] Mitchell C and others. Meta-analysis of public perception toward xenotransplantation. Xenotransplantation. 2020.
[5] The National Centre for Social Research 2024. NatCen Opinion Panel [Online] (Viewed on 18/11/2024)

should not be genetically modified (31%) or kept in sterile conditions indoors (24%), solely to provide organs for human transplantation.

Fifty-nine percent of the sample would be willing to accept a transplant from a pig (figure d) but this proportion was significantly lower among those who did not eat meat (36%) or who did not eat pork (24%). Muslims were significantly less likely than other religious groups to be willing to accept a pig transplant even if their chances of survival before a human organ became available were low (17%). Few differences were observed when we cross-tabulated responses by UK country (or regions of England).

The main reason given for accepting a transplant from a pig was if the chances of survival before a human organ becomes available were low. The main concerns related to mixing animal and human DNA (32%) and risks of infection from animals (24%) (figure e). Approval of the specific organ and procedure by an independent organisation similar to the Medicines and Healthcare product Regulatory Agency (MHRA), was the measure most respondents felt would encourage them to consider accepting an animal organ.

The public's threshold regarding when xenotransplants should be made available on the NHS was high, with 41% indicating they should only be introduced after they become as successful as human organ transplants. Respondents indicated that patients who have waited the longest for a suitable human organ should be a high priority for animal-to-human organ transplants (if proven to be safe and effective). Patients who had already received an animal organ, however, were seen by most respondents (58%) as a lower priority for a human organ transplant provided their animal-to-human organ transplant was functioning satisfactorily.

Lastly, the prospect of a new supply of organs for transplants did not seem to have an impact on views on current organ donation at the end of life, with over three-quarters of respondents indicating that it would not affect their willingness to donate their organs (figure f).

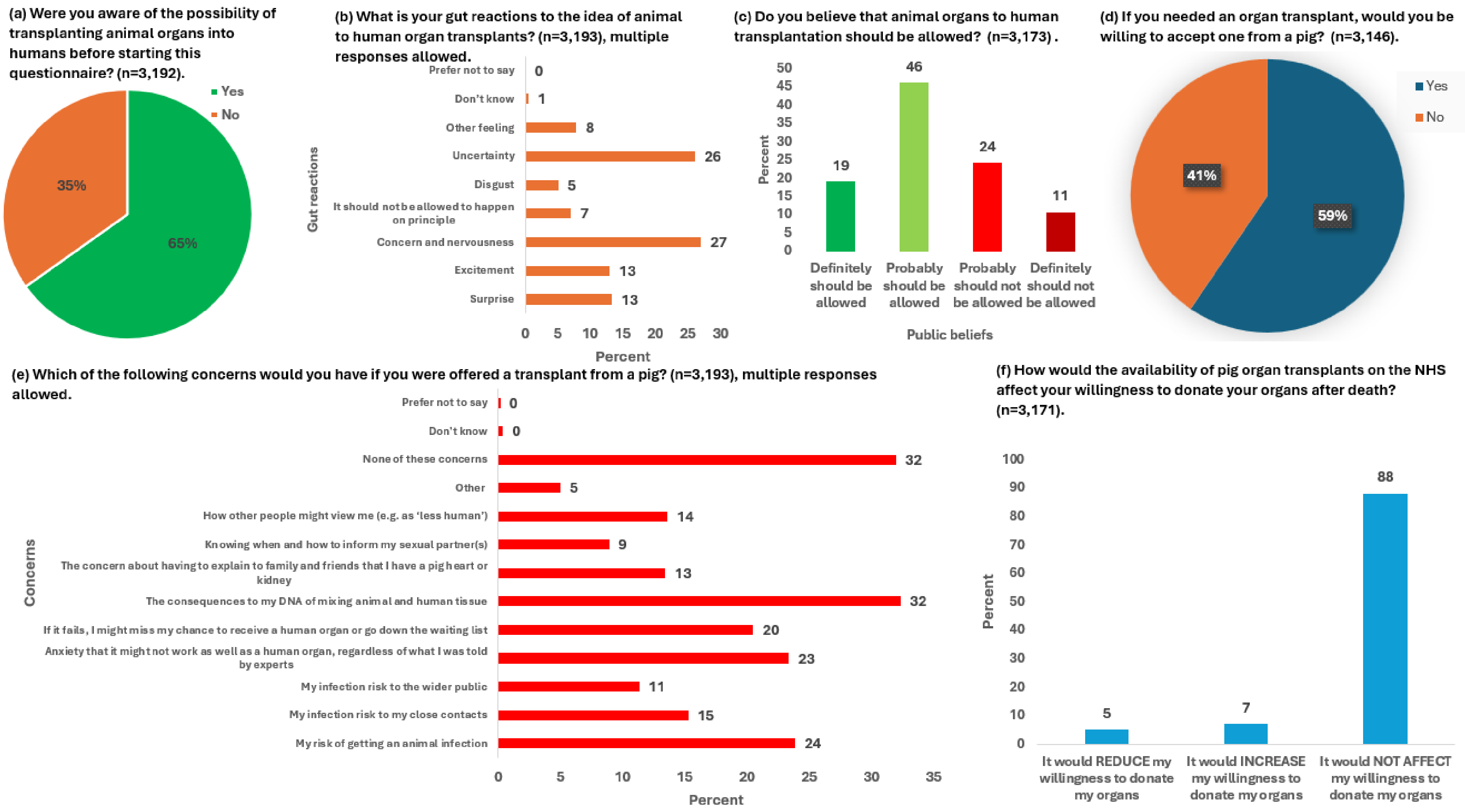

Figure 1: Public attitudes and views on xenotransplantation

Acknowledgements

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Appendix 2 – Advisory Group Terms of Reference

Advisory group Terms of Reference, including membership can be found on the Implementation Steering Group for Organ Utilisation webpage, under sub-groups - Xenotransplantation.