

A cross-country comparison of how 'public opinion' is studied and understood in relation to stem cell research'

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Summary Report of Public Opinion/Engagement Literature

Introduction

Over the last few years there has been a rapid expansion of research seeking to document people's views about stem cell research. With a recent shift of emphasis onto 'upstream' engagement, a diverse range of publics have been invited to become stakeholders in the policy-making and innovation process. However, there are gaps between the range, complexity and ambivalence of responses that characterise everyday talk (public discourses), and how these are shaped by the mass media and different lobbying groups and used by policy makers (discourses about the public).

The aim of this project is to gain a critical and reflexive understanding both of 'public discourses' and 'discourses about the public' at every level, and how these impact on policy making and innovation in this field. This review constitutes the first of three stages, being a nuanced summary of international perspectives on public engagement with stem cells. First, the method is briefly outlined in terms of approach, and its limitations. Second, this is followed by a concise, cross-comparative critique of findings, methods, construction of publics and spatio-temporal differences between studies.

Approach

Methodologically, the first stage of the research was approached via a systematic review of all 'English-speaking' work on public responses to stem cell research. Examples of such work include surveys, focus group studies, interviews, consultation exercises and engagement initiatives such as plays, citizen juries and online Weblogs. These public engagement initiatives were identified via a number of strategies outlined below.

- First, key policy documents/consultations were identified, and their bibliographies scanned for relevant studies that had been utilised. One example was the Human Fertilization and Embryology Authority report on *Public Attitudes to Fertility Research, Embryo Research and the Regulation of this Work* (HFEA, 2005).
- Second, a series of relevant websites were identified and searched. These included those belonging to:
 - Key funding bodies and lobby groups such as the Christopher Reeve Foundation (<http://www.christopherreeve.org/site/c.gelMLPOpGjF/b.899265/k.CC03/Home.htm>) and Church of Scotland (<http://www.srtp.org.uk/cloning.shtml>).
 - Large survey companies such as MORI (<http://www.mori.com/>) and Opinion Research Corporation (<http://www.opinionresearch.com/>). However, due to the burgeoning number of US opinion polls and their repetitive results, boundaries were eventually drawn to limit their numbers.

- UK Genetic Knowledge Parks and research groups, particularly those of the Social Science Stem Cells Initiative (<http://www.york.ac.uk/res/sci/introduction.htm>) and UK Genomics Centres. The majority of these were studies currently 'in progress' and consequently, had limited, unanalysed or no findings.
- Third, an extensive keyword search was conducted utilising both Google, and academic literature databases such as Sociological Abstracts and Geobase. Keyword searches included: 'stem cell and public', 'cloning and public', 'embryo and public', before narrowing to 'therapeutic cloning', 'embryonic stem cell!', 'public perception', 'public engagement' and country-specific searches. During this process, a boundary was eventually laid down around the 'cloning' studies – unless 'therapeutic cloning' was specifically referenced, general cloning projects were not included as the term referred specifically to *reproductive* cloning. In effect, many studies were hence excluded from this review.
- The final approach was through 'snowballing' – contacting stakeholders, funding bodies and researchers, and requesting details of other relevant studies. Moreover, websites such as that of the International Society for Stem Cell Research (ISSCR) (<http://www.isscr.org/>), which contained lists of studies, were also mined for information.

These studies were then catalogued into a table of seven key variables plotted against each reference: date conducted, place of study (country/district), funding body, type of stem cell research, type of public, key findings, method, and how the study was located. Figure 1, below, illustrates the layout of this table.

No	Reference	Date conducted	Place of study	Type of Stem Cell	Type of Public	Key findings	Methods Used	How located
4	Belden, Russonello and Stewart (2004) The View from Mainstream America: The Catholic Voter in Summer 2004: A National Opinion Survey of Likely Catholic Voters. Unpublished report. Available on: http://www.catholicvote.net/research_polls/	2-11/06/2004	USA	Embryonic	Catholic voters	72% of Catholic voters support "allowing scientists to use stem cells obtained from very early embryos to find cures for serious diseases such as Alzheimer's, diabetes and Parkinson's". Strong support (34%) outnumbers strong opposition (12%) by almost 3 to 1. Bush supporters and Catholics, in	Opinion Poll	Web – ISSCR website via NIH Stem Cell Information website

	catholic_vote/index.htm					majority, support SCR. Most likely to support it are liberals and Catholics who do not attend church.		
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Figure 1: Summary Table of Public Engagement with Stem Cell Research in English-speaking countries.

As some of these studies were still ongoing, a description of each project was substituted for key findings. Multimedia documentation and unanalysed quotations were omitted from the table, to maintain compression, but printed as hard copies, and filed alongside other documents. Finally, the table was subdivided, first by country/continent, and second, by its primary focus on qualitative or quantitative approaches.¹

Below, I present a preliminary analysis of the key findings of this endeavour, under the following sub-headings: Methods, Temporal Changes, Constructing the Public and general Findings.

Methods – International Comparison

It appears that in the USA, research on public perceptions of stem cells has been dominated by opinion polls. These polls were generally initiated by patient and election campaign stakeholder groups, who then contracted out to specialist firms. For instance, in 2004, the Juvenile Diabetes Research foundation (JDRF) sponsored an opinion poll on stem cell research, undertaken by First Media Services. Other polls were commissioned by media companies such as ABC News and The Wall Street Journal, to construct headline news during election campaigns. The majority of these studies were large-scale surveys of 500-2500 participants, conducted as telephone interviews, in a compact time period of between 3 days to a week. Some studies were national, others were state-wide.

In contrast, following a long history of such research, studies in the UK have primarily been qualitative, with data gathered through interviews and focus groups. Many were embedded in wider studies on stem cells regulation, perceptions of stakeholder groups, and international comparisons. However, more experimental engagement events have recently emerged, such as a play on stem cell research aimed at teenagers (*Learning to Love the Grey* by Y Touring Company), a citizen panel (Davies, 2006), deliberative mapping (Davies, 2006), dialogic conversations (Parry, ongoing), roundtable conferences (Kotchetkova, ongoing), vignette studies (Shepherd and Senior, 2004), public debates (in Cardiff and Edinburgh), a consultation forum (MRC, 2004) and an online discussion forum (BBC News). Research in the UK has been primarily sponsored or conducted by funding bodies, such as the ESRC or MRC, along their policy guidelines.

In terms of English-speaking outputs, Europe has been dominated by quantitative, cross-comparative Eurobarometer studies, in league with some public engagement events in Berlin/Brussels that have been translated into English and posted online. In particular, the

¹ Any mixed method techniques were subsumed under the 'quantitative' category.

consensus conference has been a popular choice among EEC countries such as Germany, Norway and France.

Finally, Australia and New Zealand took a qualitative/quantitative approach, utilising surveys, focus groups and interviews to triangulate results. It is notable that New Zealand has employed the 'upstream' UK model, and its Bioethics Council is currently running a series of public engagement events on the use of embryos in research. This commitment to public engagement may also in part be associated with national identities that value a utilitarian and democratic society (Hunt et al, 2003). Following the UK, research was funded by public bodies such as the Foundation for Research, Science and Technology (FoRST), The New Zealand Bioethics Council and Biotechnology Australia.

What proved interesting in these studies was not just their general approach, but their presuppositions and purpose and hence, impact on the kinds of questions asked.

In the USA, the main thrust of questioning has been on what percentage of the voting public support embryonic stem cell research (which was usually worded in press releases simply as 'stem cell research'). Behind this, was a desire to identify whether religious or political affiliation were correlated to results and hence, decision-making during referendums. Namely, did supporters of President Bush support stem cell research, and hence did their values conflict with his political stance towards it? Later studies sought to investigate whether potential voters supported the movement to instigate federal funding of new embryonic stem cell lines, and more strategic studies attempted to play-off moral dilemmas around the use of embryos to obtain stem cells, against the possibility of using the latter to cure disease.

In contrast, following a qualitative approach, the UK questions fell into a number of categories, many of which were policy-oriented and related to wider social issues. These included:

- Investigating the willingness to donate of potential donors of foetuses and embryos, by exploring their attitudes and values towards donation, research and potential treatments (Franklin and Roberts, 2006; Haimes et al, ongoing; MRC, 2004; Parry, 2006). Namely, how are patients asked to donate? What are the issues they are concerned about? How can consent procedures be strengthened?
- 'How new technologies were encouraged/prevented from diffusing from 'bench to bedside' and potentially to the market place' (Williams et al, ongoing).
- How different discourses about stem cells were mobilised and interpreted by key stakeholders.
- How decisions were made in a specific way and the factors shaping these (Parry, 2006)
- The examination of temporal changes in attitudes and understanding the role of ambivalence in relation to SCR (Shepherd and Senior, 2004)
- To investigate the views and concerns of diverse social groups around stem cell research (Parry et al, ongoing)
- The impact of terms such as 'therapeutic cloning' on people's willingness to donate embryos.
- Comparing the views of different stakeholder groups such as potential donors and non-donors to determine the impact of their subject positions on attitudes to stem cell/embryo-based research.
- What were effective empirical methods to address these questions? (Franklin and Roberts, 2006)

- Issues around governance and regulation. Were the rules around embryo/stem cell research strong enough? Who were trusted sources of information? Who should develop these frameworks?

Whilst these questions were representative of project objectives, more general and emergent issues were arguably explored in public engagement events that sought to entertain a dialogue between 'publics', other stakeholders and 'experts' by temporarily disabling the barriers between them. However, these well-intentioned events were not without their difficulties, and as evidenced in the Cardiff-based Technquest public debate, some audience-based questions appeared to be staged, and at the very least, so did 'expert' responses. Not only were barriers re-instated, but the whole drama was enacted through the deficit model (see Wynne, 1991) of an ignorant public needing to be educated.

In Europe, similar questions have pivoted around 'public' approval and supportiveness of stem cell research and therapeutic cloning. The underlying values attributed to these decisions were explored; values assumed to be dependent on understandings of what an embryo is, impacted by the dilemma publics have between two competing moral positions, and determined by religious practices/affiliations. Finally, concerns over societal consequences have also been addressed. In consensus conferences, general issues such as the ethics of embryo research were brought to the fore for debate:

- 'Is "destructive embryo research" ethically acceptable? What should be done with the spare embryos from IVF?' 'Is it possible to reach a consensus on sensitive issues such as embryo research? If so, how?' (European Commission, 2002).
- 'Research on stem cells: hopes and limits'. The human embryo: object or research subject?' 'Regulation of stem cell research – Why? How?' (Frischmann and Cure, 2002).

The predominantly qualitative approach to New Zealander's perceptions of stem cells focused around questions such as:

- Decision-making processes around the acceptability of stem cell research (SCR).
- Exploring the role of group dynamics in determining attitudes and values to SCR.
- The influence of ethnic backgrounds such as Maori, Asian, Pakeha and Pacific Islander on determining perceptions of SCR.
- Religious beliefs and SCR.
- Understandings of key terms associated with SCR (see Bioethics Council, 2006; Coyle et al, 2003; Hunt et al, 2004).

Similarly to Europe and the UK, quantitative studies in Australia (Critchley and Turney, 2004; Farquharson and Critchley, 2004) placed emphasis on public trust in organisations regulating stem cell research, religious influence, relative support for SCR and interestingly, whether this was linked to a pro/anti-science stance and trusted sources of information. Moreover, these studies attempted to explore people's level of understanding in everyday life, asking participants whether they could explain SCR to someone else, or about their awareness of stem cells in the treatment of disease, their general familiarity with medical research and their understanding/familiarity with the different types and sources of stem cells.

Temporal Changes

A longitudinal examination of the studies revealed a series of temporal changes, with regard to research methods, engagement events and subsequent findings. The most significant of these were in the UK, whose interest in stem cell research was initially subsumed under the rubric of cloning, embryo research or genomics. Powered by an ESRC stem cell initiative, further research narrowed to focus specifically on stem cells, whilst simultaneously diversifying to include publics as one actor in a network of many or examining a wide range of different publics as stakeholders. Furthermore, perhaps initiated by a New Labour emphasis on engaging communities in public decision making (see Barnes et al, 2003: 379), the last 3 or 4 years have seen a slew of experimental public engagement events as outlined in this summary. Such events attempted to go beyond the stereotypical qualitative approach of participant-researcher, and engage a wide-range of publics, stakeholders and experts in dialogue.

In Europe, arguably due to the complexities of gathering cross-nation information, the Eurobarometer survey has remained the major landmark in data about publics and stem cells. However, one significant issue was linguistic in nature. Eurobarometer 58.0 (Gaskell et al, 2003) signified a pivotal change from questions on the cloning of 'human cells' to cure 'sick cells' (INRA (Europe)-ECOSA, 2000) to questions directly on cloning and 'stem cells'. Eventually in Eurobarometer 64.3 (Gaskell et al, 2006), questions that related to stem cell research in its own right were added, for the first time. Moreover, methodologically, recent years have marked the increasing popularity of 'consensus panels' as a tool for engaging citizens.

In Australasia, research focusing on stem cells and publics has been relatively absent, again subsumed under public perceptions of biotechnology. However, over the last few months the public debate on the use of embryos in research in New Zealand was initiated by the Bioethics Council, and appears to be both experimental in terms of methods and outreach. It will remain to see whether the Foundation for Research, Science and Technology follows through with complimentary research funding initiatives for university-based researchers.

In contrast, the USA has remained fixed on sweeping opinion polls, the main difference between those in 2001 and 2005 being more emphasis on 'should policy on the use of stem cells lines be changed?' and a general weighting on federal funding for the production of new stem cells lines. Moreover, in quantitative terms, there appears to be a greater number of polls initiated in 2004-5 than 2001 and alongside this, an increase in support for embryonic stem cell research altogether.

Constructing the Public

For countless years, 'the public' has been a term that has been unproblematically constructed and utilised in research, policy and media. Indeed, as Barnes et al (2003:396) argue, this tends to 'privilege notions of a general public interest' and 'marginalize the voices of 'counter-publics' in the dialogic process'. More recently, it was argued that the view of a monolithic public has dissolved into understanding publics as 'active, knowledgeable, playing multiple roles, receiving as well as shaping science' (Eisnedel, 2007:5). Moreover, as Eisnedel argues, these new subjects have been constituted as 'rational individuals' who construct knowledge and ignorance in light of rational calculations or by optimizing purposive behaviours. This, she thinks, is in error, disguising the everyday complexities, 'muddling' and continuous learning experiences associated with being human.

Taking this geographically and temporally wide-scale approach to understanding publics and stem cells has some important implications for these assertions. In this section, I focus on the manifold ways in which 'the public' are geographically categorised and under what circumstances, how they are represented by particular methods utilised and how these mediums represent the various publics 'on paper'.

Perhaps it is in the USA that the most challenging representations of 'the public' occur. US opinion polls tend to collapse 'publics' into citizen-voters whose statistical profile slots into one of two main categories: 'party affiliates' or 'religious persons' or some combination of both. The emphasis on religious affiliation seems to portray Americans as fundamentally religious persons, predominantly from a variety of Christian backgrounds, a stance that denies any presence to other minority religions in the great cultural melting pot. Alternately, US publics are represented as politically active, attitudinal and somewhat fixed in their political position (particularly in comparison to attitudes towards stem cells). This entertains a somewhat splintered and ultimately limited view of American attitudes towards stem cells and creates a rather 'wooden' public that pops up onto centre-stage like a Punch and Judy puppet, every time a referendum appears on the horizon. In the theatre, they have their 'de-limited' responses to survey questions. Moreover, in between these critical times, the splintered American public remains invisible or perhaps 'insignificant', no longer an object for mass communication. Ultimately, this creates a 'dark age' of public opinion data. Finally, by emphasising temporal change in opinion, the grey areas of American public are represented as plastic, malleable and capable of change. The reasons for this change, however, are rarely if adequately addressed. Thus, with a consumer-driven preference for opinion polls and wide-ranging surveys, what we are left with is a disembodied American public who are reduced to black dots, bar charts, and Excel tables (see Brown, 1995) as their agency and subjectivity are further rendered invisible.

Like the USA, the European public, in general, are statistically constructed through the Eurobarometer. However, this public are also to some extent, a 'thinking public' whose dilemma is recognised and some attempt made to qualify it that goes beyond a mere play-off between the moral status of embryos and saving lives. They are represented as a public that believe in tight regulation and an emphasis on the societal consequences of stem cell research. This construction, to some extent carries over to the popular 'consensus citizen' conferences, where these 'thinking citizens' are allowed to deliberate the issues around stem cells in an apparently democratic arrangement. However, such publics are conceived as a minority of 'acceptably thoughtful and informed' but 'problematic' and often 'uninformed' citizens, in comparison to the 'unitary and natural' factual arguments of scientific experts (Kelly, 2003: 354-355). Finally, the individual viewpoints of these nation-state European publics were often compressed into indistinct, unemotional summary reports or a random scattering of juxtaposed vignettes (European Commission, 2002) that led to an overwhelming sense of untranslatable heteroglossia (Bakhtin, 1974).

In New Zealand and Australia, the term 'the public' was still engaged as a term, yet methods and analyses seemed to be more nuanced than simply referring to a monolithic 'general public'. For instance, research in New Zealand utilised focus groups, not only of mixed demographics, but of an 'ethnic public' that attempted to represent key groups in the country such as 'Asians', 'Pacific Islanders' and Maori. Moreover, these studies also drew on a place-based public: rural or urban, north or south islanders (Coyle et al, 2003; Hunt et al, 2003; Roberts et al, 2004). Nevertheless, these were artificially simplistic divides and often the origins and ethnicity of focus group participants were more complex. However,

with an emphasis on a nuanced analysis of 'individuals' within the research, the studies constructed micro-publics who were both dialogic and able to make emotionally-based decisions. Moreover, for Hunt et al (2003), these publics were constituted through their national identities as New Zealanders: egalitarian and pragmatic in their attitudes to stem cells. Hence, we witness a 'resourceful public' engaged with science in a democratic society. More recent, ongoing studies were framed within the potential uplifting of a moratorium on embryonic stem cell research and potential policy change. This parallels the USA in some respects, with the construction of a temporally 'visible public', but the major difference is that of a democratic engagement with policy, the embodied status of this particular type of visibility and its prolonged status.

Conversely, the appeal to triangulation of data and hence, large scale surveys in both New Zealand and Australia still resonates with the latent sense of disembodiment characterising the USA. Yet, here, the difference is that although these publics were charted and mapped in terms of percentage agreements, and boxed into charts and tables, there was also some attempt to map the mental spaces of subjectivity. Namely, an effort was made to approach the complex web of ambivalence via multi-level survey questions, the use of scenarios and subsequent creation of mental maps of thought processes. Moreover, many of these studies were either based on focus group research (and hence, questions were designed through consensus remarks) or vice versa (where responses to surveys were 'fleshed out') (see Biotechnology Australia, 2003; 2005; Cook et al, 2004; Farquharson and Critchley 2004; Turney and Critchley, 2004:99).

Finally, in the UK, where the term 'the public' has arguably been utilised more frequently than any other country, has been the gradual and strategic sub-division of this monolithic structure into clusters of interrelated stakeholder groups. Thus, in general, publics are now represented as: patient advocacy groups, IVF/PGD patients, potential embryo donors/non-donors, support groups, religious groups, blood/organ-donors, youths, women who have experienced abortion and company representatives. To some extent, in terms of its recurrent portrayal as being 'human', even the embryo in question can be viewed as a stakeholder who is unable to expound an opinion. This fragmentary approach has diversified over time, as publics are viewed as one stakeholder among many in the stem cells debate at local, national and global scale levels. Whilst a novel and somewhat democratic approach, it serves to disguise the inevitable and unequal power relations that are already in force before these stakeholders meet and debate.

Although these stakeholders are ultimately embodied, emotional and dialogic publics, engaged in debate and education, the extent to which extreme responses are rubbed out of the bell-curve of summary reports or final decision-making processes remains to be seen. Finally, whilst 'the public' has been categorised into smaller, representative sub-groups, these sub-groups in themselves are still monolithic and problematic. Namely, as Barnes et al (2003:396) suggest that general theories of discursive constitutions of subjects still do little to capture the complexity and diversity of the ways in which these conceptions are negotiated and remade within various public engagement arenas.

Findings: what are people saying?

Approval and Deciding Factors

Overall, there seems to be a majority of publics in favour of stem cell research, in the USA, Europe, the UK, Australia and New Zealand. In terms of preference, adult stem cells appear to be the most favourable, arguably due to the perceived ability of donors to

regulate consent procedures. At the other end of the scale, the use of embryonic stem cells was more at risk of disapproval from some members of the population – notably pro-life supporters, women who had experienced abortions and religious organisations such as the Church of Scotland. However, whilst reservations were undeniable, and potentially linked to ‘destroying’ embryos, a general preference was expressed for ‘extra’ embryos from IVF clinics for use in medical research (Nisbet, 2004).

Nevertheless, this does not mean that diverse publics are completely abhorrent to the use of ESCs, as demonstrated by a temporal increase in supportive majorities. For instance, in the USA, 61-63% of the general population were in favour of ‘stem cell research’ in 2001 (ABC News, 2001; Harris Poll, 2001), with an overall rise to 58-73% in 2004 (Harris Poll, 2004; KRC Research, 2004; Mellman et al, 2004; Virginia Commonwealth University, 2004) with slight fluctuations in these percentages in 2005/6 (Opinion Research Corporation, 2006; Pew Research Center, 2005). Furthermore, these results *generally* suggest that supporters of President Bush/Republicans and Catholics/Evangelical Christians, who are often represented as protesters against embryonic stem cell research, are actually in favour of it, if by a small majority. However, as KRC Research (2004) reveal, with reference to 2001 data, the nuanced wording of surveys can have an apparently direct bearing on results (see also Nisbet, 2004). Notably, a basic analysis of some of the questions revealed the following linguistic divisions:

- *Embryo Description* – a playoff between the ‘cruel’ destruction of a human subject (‘destroyed’ or ‘potential life’) against making use of an unwanted object (‘discarded’, ‘spare’, ‘leftover’, ‘extra’). Whilst the latter phrases have been mobilised in recent surveys, it was interesting to note that the idea of ‘usefulness’ spontaneously emerged during focus groups in Australia and New Zealand. In this context, where ‘pragmatism’ is part of the national ideologies, the terms ‘unwanted matter’ or ‘waste’ were often mobilised to describe unused IVF embryos, so that they might serve a ‘useful’ purpose.
- *Stem Cell lines* – their transcendence was often emphasised in surveys with the word ‘immortal’, which for some participants raised red flags.

Moreover, evident in the USA, ‘embryonic stem cells’ are frequently referred to as ‘stem cells’ in poll titles, and particularly in press releases. The political motivation behind this is unclear, but it does raise questions such as: what impact does this have on representation of public perceptions, and how fully did survey participants understand what they were being questioned about?

Stem Cells

Internationally, there are a number of issues that diverse publics raise when offering their take on stem cell research. The two most cited examples seem to be the almost clichéd playoff between utilising embryonic stem cells to devise new medical treatments and destroying a ‘potential’ life to do so. Namely, this emerges in the phrase, ‘destroying a life to save a life’. Other deciding factors included: research that benefits the young over the old, concern that stem cells would take us beyond our ‘natural’ lifespan, inequalities between those who donated for financial gain but were unable to afford potential treatments themselves, previous experiences of biomedical error, little or no a-prior knowledge about non-e-SCs, the pluripotency of e-SCs compared to other forms of stem cells, altruism and the potential for an advance in scientific knowledge, being positively

inclined towards research in general and certain socio-economic groupings such as class, level of education and ethnicity.

Embryonic stem cell research has problematically been embedded in debates, both on IVF and therapeutic cloning. In all research accounts, the term 'therapeutic cloning' was not a popular one, and statistically in the US and Australia, has been shown to decrease public acceptance of stem cells created through SCNT. Moreover, a study by the Wellcome Trust (1998) avoided the term 'therapeutic cloning' altogether in the research process. However, with another take on the issue, Gaskell et al (1999) suggested that in Europe, there was actually greater support for cloning human cells/tissues than animal cells. They reasoned that moral concerns thus appear to attach specifically to particular applications of SCR and not necessarily to underlying biological techniques. Here, the scope of intervention, whole versus partial cloning and its intended uses played the biggest role in decisions on its acceptability.

Ambivalence

Ambivalence to the topic of embryonic stem cell research was one of the key findings of this review. However, it worth explaining just how this term manifested in research conclusions. First, there was a 'contextual acceptability' among many participants of qualitative studies, in that as one participant put it, it was impossible to make a decision until you had 'walked a mile in someone else's shoes': that someone being a patient needing stem cell-based treatment (Eureka Strategic Research, 2005). Notably, this analogy was strikingly similar to one used in the novel, *To Kill a Mockingbird*, and draws us to the important recognition of difference to ourselves. Second, we seem to be dealing with different kinds of ambivalence – for instance, in the USA, with the absence of explanatory information, but presence of shifting data on support for ESC, there exists a form of 'black-box ambivalence' characterised by its inexplicability or invisibility. Alternately, in Europe, the UK, Australia and New Zealand, where qualitative studies predominate, we see 'emotive ambivalence', where publics are strongly tugged in multiple directions by competing value-systems. An example comes from New Zealand focus groups where some participants saw e-SCR as 'unnatural' but that its medical value should not be discounted, or referred to destroying a life to save a life, or that e-SCR was harnessing a 'natural process' but 'just didn't feel right' (Coyle et al, 2003; Hunt et al, 2003).

Status of the Embryo

Much of the explanatory emphasis on attitudes to stem cells has been placed on the status of the human embryo. Often participants were confused about the differences between embryonic stem cells and foetal or umbilical cord stem cells. This was evident in both the recent work of Julie Kent in London and Australian studies that attributed it to the association of both with 'babies'. Moreover, among many IVF women, the embryo was often conceptualised as a baby or potential sibling to current children. When this happened, the imagined futures of what these 'babies' became unethical – namely, babies were conceived as 'specimens' in jars. Horror stories of 'research without justification' or 'a *Brave New World*' with 'little me's in little jars' or 'little babies in bottles' depicted the fears of a macabre imagination (see McMahan et al, 2003). These imaginaries appeared to influence some participant's stance towards embryonic stem cell research, with the majority of potential donors unwilling to donate. Indeed, as Parry (2006) assuaged, all participants undergoing IVF agreed that 'viable embryos' should be used for reproductive purposes only, rather than research. However, in saying this, if embryos were imagined

as 'clumps of cells', their use to obtain e-SCs was more acceptable, particularly if under 14 days old and if it was guaranteed that they felt 'no pain' (see Wellcome Trust, 1998).

Interestingly, it was a US qualitative study that explored an alternative approach to the status of the embryo, and how it was envisaged by different stakeholders (Ganchoff, 2004). Here, the temporal aspects of the embryo were mobilised in attempts to justify a variety of subject positions. In some instances, the embryo was fast-forwarded to become aunts and uncles, in others, it was dissolved back into a pre-embryonic ground state of cellular potential that could eventually transform medicine. In effect, Ganchoff argued that 'these different techniques and mechanisms become political technologies as they organise and classify, as well as bring to light, the possibilities of new relationships and subjectivities' (Ganchoff, 2004:768-9).

Religion

In general, religious publics were usually associated with Judeo-Christian values and hence, they were often predictable references to scientists 'Playing God' or 'interfering in God's work'. Additionally, in New Zealand, the indigenous Maori voice was also raised, where the use of embryos for research went beyond whakapapa (ancestral lineage): 'your tinaga mixed with your wairuatanga' (Bioethics Council, 2006). Like blood and organ donation, embryo donation was wholly unacceptable on religious grounds. Furthermore, for those participants who reported commitment to religious beliefs, their worries and concerns seemed more related to pre-existing beliefs than current circumstances and future intentions (McMahon et al, 2003). However, whilst religious vocabularies dominated public discourse, as Gail Davies suggested, they were employed in order to open up dialogues that were important to participants such as the offence to social beliefs that e-SCR precipitates and discussions about embodiment.

Regulation

In Europe, it was agreed that a series of diverse public opinions made it difficult for any continental legislation to be decided upon (European Commission, 2002). As agreed in a Berlin-based Citizens Conference, though, this opened up a space for discussion and exchange of ideas (Bioethik Diskurs, 2003).

The unique position of New Zealand, both geographically and in terms of its moratorium on e-SCR, perhaps influenced research participants who wanted a 'paper trail' attached to all stem cells lines, so that future donors could be traced (Bioethics Committee, 2006). This paralleled other international studies, where publics (both general and as potential donors) wanted to see appropriate control over researcher's activities to prevent the inappropriate exploitation of people. In particular, potential donors wanted more control over the consent process and even which types of research their embryonic stem cells would be used for (McMahon et al, 2003).

In the UK, the HFEA (2005) study claimed that 42% of their participants believed that the rules governing e-SCR were strong enough, at present. Moreover, there was a belief that frameworks should be developed by doctors and parliament working together – never alone. This poses an interesting question about trust, which would be interesting to explore in a more detailed study. The HFEA backed up their assertions with evidence that UK regulation was the most nominated to be trusted in decisions about human embryo research and to provide 'honest', 'balanced' information on research and regulation.

Saying this, half of the general public thought that research would eventually lead to human reproductive cloning even if it was prohibited by UK legislation. Moreover, in Germany, where there is also a moratorium on e-SCR, two thirds believed that the majority of the population would eventually approve of it due to medical successes, and the majority of experts believed that in the next 20 years, there would be an easing of regulations around the Embryo Protection Act (Wiedemann et al, 2004). It seems that whilst publics are reasonably aware of national regulations, they are also aware of the plasticity of these rules and their limited protection in space and time.

Conclusion

A review of the literature on public engagement with stem cells sought to problematize both over-simplistic representations of public attitudes and the notion of a monolithic public. Geographically, this review focused on an international perspective in order to see if 'place' and 'space' were important factors in these representations and misrepresentations. A point form summary concludes the general findings of this research.

Methods: Funded by research councils, Australasia, the UK and individual countries within Europe favoured traditional and experimental qualitative techniques. In contrast, USA-based funding bodies were primarily patient groups seeking evidence to support their protest against regulatory policies enforced by the Bush administration. Research was conducted by consumer-research groups, rather than being university-based, featuring the use of large-scale opinion polls conducted in extremely short time periods that predominantly corresponded to referendums. New Zealand and Australia also incorporated survey techniques, but conducted these initiatives via universities and usually triangulated them with focus groups. This may possibly be a pragmatic move, due to the geographically widespread, but comparatively small populations.

Findings: Both qualitative and quantitative research suggested that the majority of participants were supportive of all forms of stem cell research, with a preference for adult/cord blood, over foetal and lastly, embryonic. Internationally, a significant majority knew little or nothing about stem cell research other than embryonic and most of these opinions were derived from information presented during engagement activities. Moreover, attitudes were once again, tinged with an ambivalence that was noted, but in many studies, not thoroughly interpreted. I suggest here, that the term needs further clarification, preferably through focus groups that provide an arena for the observation of social processes in determining the dialogic relationship between idiosyncratic and cultural modes of regard. Although religion was frequently mobilized in the USA as an important category in determining public opinions, qualitative studies in New Zealand, Australia and the UK revealed that whilst religious appeals were both heard and heated, their role was relatively minor. Rather such references often emerged in relationship to wider concerns with safety, the instigation of ethical boundaries and concern over the use of woman's bodies as embryo-making machines. Finally, recent UK-based research witnessed the breakdown of the monolithic public into a series of sub-categories, in a somewhat reductionist attempt to see individuals as a collection of stakeholders or scientific citizens. An important comment here, is that whilst the UK, Europe and Australasia have favoured this term, 'public', it might be relevant to examine its etymological roots as a category, for in the USA, the term 'citizen', with all its allusions to nationhood has historically been

favoured. Hence, can the two terms and their sub-categories actually be compared in the ways I have attempted? Can US citizens be re-classified as publics?

With these conclusions in mind, an important next step will be to examine the role of the media in its uptake of results and constructions of 'virtual publics' that enter the dialogue of everyday life. Moreover, some critical theory that focuses on space, place, time and embodiment in these constructions would certainly add to our understandings of them. For instance, Lefevre's (1991) notion of 'the production of space' could be utilised to structure the dialogic relationship between pre-conceptions of publics (and their impact on research design), representations of publics (in research and media and policy documents) and the spatial practices that shape them. Another example would be Bakhtin's (1981) chronotope, which could be used as a framework for understanding the role of space, time and embodiment on the international differences between research design, findings and construction of publics. In what kinds of chronotopes are publics conceived and represented? How do these space-time matrices determine the narrative that different publics can tell?

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