

**MRC scientists and the media:
Attitudes to and experiences of reporting
their findings to the public**

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Declaration

I, the undersigned, hereby declare that the work contained in this assignment is my own original work and that I have not previously in its entirety or in part submitted it at any university for a degree.

Abstract

Background: Scientists seem to have an ‘international corporate culture’ of mistrusting the media. Attitudes of South African scientists to the media and their experiences of reporting findings to the public and media have not been documented. The South African Medical Research Council (MRC) is a statutory research body with an excellent research record - but awareness of the MRC among the South African public is almost non-existent. The MRC needs to publicise and increase knowledge of its goals and research findings by promoting scientists’ engagement with the public and other stakeholders.

Objective: A postal survey was carried out among MRC scientists to obtain a ‘baseline’ indication of attitudes and experiences regarding communication to the public and media. Results would inform development and implementation of strategies to fast-track a turnaround in culture at the MRC towards promotion of science communication.

Method: A questionnaire with prompted responses was sent to 253 MRC scientists. One hundred were returned (39.5%), representing an impressive assemblage of the MRC’s research leaders.

Findings: Although 48.9% of the scientists had each published over 30 articles in peer-reviewed journals, 38.9% had never had these articles mentioned in the lay media. Yet the scientists regard ‘the public’ and ‘policy makers’ as the most important groups they should communicate with, and most think the public glean their knowledge of scientific research and its implications from the lay media. The scientists might not trust the media to provide accurate scientific information, but they feel that the general public *do*. The vast majority (92.8%) strongly agree or tend to agree that they have a duty to communicate their research and its implications to the public, and 70.8% would like to spend more time on this. However, the scientists also agree that the day-to-day requirements of their jobs leave them with too little time to communicate the implications of their research to others (47.5%) or even to get on with research (36.4%). Most of the scientists had never had contact with the media, or only every few years. When the source or subject of a news story, 65.4% had been either ‘very

satisfied' or 'somewhat satisfied' with the coverage. Many of their comments reflected unrealistic expectations which can only be addressed by training in what the media are all about. Most (86.9%) had never had any training in dealing with the media, but 80.8% would be interested in such training.

Conclusions: It is clear that the scientists generally want to communicate and see the potential benefits. For the MRC to become a communicating organisation it must spell out to its scientists the importance and value placed on their communication activities. Science communication and development of links with community and media should be seen as part and parcel of scientific research, and given due recognition and support. Policies must be agreed and communicated with the scientists about recognising, encouraging and rewarding such efforts. The MRC also needs a clear media strategy giving guidelines on specific situations, as well as on the Ingelfinger rule.

Opsomming

Agtergrond: Dit kom voor asof wetenskaplikes 'n 'internasionale gedragskode' het om die media te wantrou. Gesindhede van Suid-Afrikaanse wetenskaplikes teenoor die media en hulle ondervinding van die bekendmaking van hulle bevindinge aan die publiek en die media is nog nooit opgeteken nie. Die Suid-Afrikaanse Mediese Navorsingsraad (MNR) is 'n statutêre navorsingsliggaam met 'n uitstekende navorsingsgeskiedenis - maar die Suid-Afrikaanse publiek is haas onbewus van sy bestaan. Die MNR moet sy doelwitte en navorsingsbevindinge openbaar maak deur wetenskaplikes se kontak met die publiek en ander belangegroep te bevorder.

Doelwit: 'n Posopname is onder die MNR se wetenskaplikes gedoen om 'n 'basislyn' aanduiding van hulle gesindhede teenoor en ondervinding van kommunikasie met die publiek en media te verkry. Die resultate hiervan sal die ontwikkeling and implimentering van strategie om 'n vinnige handomkeer in gebruike by die MNR ten einde die bevordering van wetenskapskommunikasie te weeg te bring, stuur.

Metode: 'n Vraelys met voorgestelde antwoorde is aan 253 MNR wetenskaplikes gestuur. Eenhonderd is teruggestuur (39.5%), wat 'n indrukwekkende groep van die MNR se navorsingsleiers verteenwoordig.

Bevindinge: Alhoewel 48.9% van die wetenskaplikes elk al meer as 30 artikels in portuurevalueerde joernale publiseer het, het 38.9% nog nooit enige dekking in verband met hierdie artikels in die lekemedia ontvang nie. Desondanks beskou die wetenskaplikes 'die publiek' en 'beleidmakers' as die mees belangrike groepe waarmee hulle moet kommunikeer. Die meeste dink ook die publiek verkry hul kennis van wetenskaplike navorsing en die gevolge daarvan vanuit die lekemedia. Die wetenskaplikes mag nie die media vertrou om akkurate wetenskaplike inligting weer te gee nie, maar hulle dink die algemene publiek vertrou *wel* die media. Die oorgrote meerderheid (92.8%) stem sterk saam of stem saam dat hulle 'n verpligting het om hulle navorsing en die implikasies daarvan met die publiek te deel, en 70.8% sou graag meer tyd hieraan wou afstaan. Die wetenskaplikes stem egter ook saam dat die dag-

tot-dag eise van hulle beroep te min tyd oorlaat om die implikasies van hulle navorsing aan ander te kommunikeer (47.5%) of om selfs hulle navorsing te doen (36.4%). Die meeste van die wetenskaplikes het nog nooit enige kontak met die media gehad nie, of dan wel slegs met tussenposes van jare. Wanneer hulle die bron of onderwerp van 'n nuus storie was, was 65.4% óf 'baie tevrede' óf 'effens tevrede' met die dekking. Baie van hul kommentaar dui op onrealistiese verwagtinge wat slegs aangespreek kan word deur opleiding oor die 'hoe' en 'wat' van die media. Die meeste (86.9%) het nog nooit enige opleiding gehad om met die media te werk nie, maar 80.8% sou belangstel in sulke opleiding.

Gevolgtrekkings: Dit is duidelik dat die wetenskaplikes oor die algemeen wil kommunikeer en ook die moontlike voordele daarvan insien. Om 'n kommunikerende organisasie te word, moet die MNR die belang en waarde wat geheg word aan wetenskaplikes se kommunikasie-aktiwiteite, aan hulle uitspel. Wetenskaplike kommunikasie en die vorming van netwerke met die gemeenskap en die media moet gesien word as 'n deel van wetenskaplike navorsing en moet paslike erkenning en ondersteuning geniet. Beleid rakende die herkenning, aanmoediging en beloning van sulke pogings moet vasgestel en oorgedra word aan die wetenskaplikes. Die MNR het ook 'n duidelike mediastrategie nodig wat riglyne oor spesifieke situasies en die Ingelfinger reël gee.

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Contents

1	Introduction	1
2	Literature Review: Researchers, reporters, relationships and responsibility	6
	From laboratory bench to park bench	6
	Battling bedfellows	14
	Intergalactic warfare?	16
	Duelling down under	19
	Getting to grips in Great Britain	23
3	The South African scenario	27
4	Survey of MRC scientists - attitudes to and experiences of reporting their findings to the media	32
	Objectives	35
	Methodology	36
	Demographics	37
5	Getting information about science out there	40
	‘Public Understanding of Science’	40
	Who do scientists think they should communicate their research to?	42
	Barriers and benefits to greater understanding of science	44
	Where do people get their information from - and who do they trust?	46

6	Communicating the scientists' own research	49
	Duty and responsibility	50
	Communication methods - and confidence	52
7	Communicating with the media - scientists' experiences and attitudes	55
	Comments about coverage	57
	Experiences of/feelings towards the media	62
	Training in dealing with the media	65
8	Communication by the MRC	68
	Ideas for interaction	72
	Additional general comments or notes from the scientists	75
9	Conclusion: Commitment to a culture of dialogue	80
	Communicating the MRC's commitment	80
	Clear policies	82
	A look at the landscape	83
	Promoting engagement	85
	References	89
	Appendices	96
I	MRC scientists and the media - questionnaire	96
II	The survey data	97

1 Introduction

“The need for science to be understood by the public and for scientists to communicate better, as well as the need for the public to make choices about what science has to offer in their daily life and participate in the scientific process, has never been greater than today ... No examples illustrate these challenges and dilemmas better than the revolution in biology (the human genome project) and the HIV/Aids epidemic that is sweeping sub-Saharan Africa.” - Professor Malegapuru Makgoba, President of the South African Medical Research Council, second James Hill Lecture to the National Institutes of Health, Bethesda, Maryland, May 2001

Many researchers used to consider their work finished by the time their research had been completed, evaluated by others, and published. Many still do. Since science is a knowledge industry in which the ‘mode of payment’ is attention, careers of scientists often depending heavily on citation ‘accounts’ (Franck 1999), this is not surprising.

In a world where science is moving at a pace outstripping the ability of law, morals and ethics to keep up, the media are still the way most adults learn about science (Hartz & Chappell 1997, Nelkin 1995, Krieghbaum 1967). The media are a critical conduit for enlightening the public about science and technology developments. It has also been shown that media coverage of research (or lack of it) impacts on which research is supported by decision-makers (Global Forum for Health Research (1999)), and that scientific papers that receive media coverage receive more citations in the later scientific literature (Gwynne 1997).

Scientists are the gatekeepers in whose hands lies the responsibility to communicate their findings to a broader audience. A closer, more co-operative relationship between scientists and journalists is vital for promoting coverage of science.

However, scientists seem to have a kind of ‘international corporate culture’ of mistrusting the

media, historically viewing the press as “sensation-mongering dumb-downers unworthy of the time it takes to do an interview” (Palevitz & Lewis 1998). This image was graphically documented in *Worlds Apart*, a 1997 study of over 1400 scientists and journalists in America. According to the study’s co-authors, reporter Jim Hartz and astrophysicist/astronaut Rick Chappell, “nowhere has the distrust toward journalists been so pronounced or so pervasive as in the science/technology community.”

If this is also the case in South Africa - where the attitudes and experiences of scientists regarding the media have not yet been assessed - then one of the many challenges facing science and its development in South Africa isn’t technical, but social.

A massive gulf between science and the citizen has been very evident in South Africa, where most science came of age during apartheid with its attendant aura of exclusivity, secrecy and elitism. Attention to public accountability was negligible. Funding was just fine around 10 (or even 5) years ago. So what if only a select circle of peers ever saw the results, little mind benefited from them?

The government of 1994 made the democratisation of science a priority, and promoted the popularisation of science as a key driver of socio-economic advancement. With government funding for research dwindling, the science councils and their scientists have to compete in an increasingly politically charged funding arena.

A system-wide review of science, engineering and technology institutions (the ‘SETI review’) commissioned by the Department of Arts, Culture, Science and Technology (DACST) in 1997 indicated the need for the South African science councils to develop and strengthen processes to enable accelerated transfer and implementation of research findings. This review recommended an increase in government funding for only one of the science councils in the country - an unprecedented fourfold increase for the South African Medical Research Council (MRC), and a much needed shot in the arm for health research.

Described in *Nature Medicine* as “the best established statutory research body in sub-Saharan

Africa” (Birmingham 1998), the MRC receives around 60% of its funding from the taxpayer via government, and hence is accountable to them. As a publicly funded body the MRC must be able to justify to the taxpayer, to DACST and to many other stakeholders why this money should be poured into it, as well as delivering - tangibly, transparently and visibly - on its mandate in terms of improving the health status of the nation. It is crucial that MRC research findings be communicated to the public - who are largely paying for it and that stand to benefit from it.

Although the MRC has an excellent track record in terms of research outputs (publications, reports, patents), awareness of the MRC and its functions among the South African public is almost non-existent. Almost the only direct communication with the public happens when research involves members of specific communities (e.g. trial sites, research relating to human behaviour, etc.).

The challenge for the MRC is to commence engagement with the public to show, in a way that the non-technical layperson can understand, that the MRC *is* fulfilling its mission of ‘improv[ing] the nation’s health status and quality of life through relevant and excellent health research aimed at promoting equity and development’.

The MRC needs to raise and improve its image and identity, and to increase public knowledge of and publicise its goals and objectives. This will help promote scientific literacy and the public debate which flows from an adequately informed base. The aim would also be to create public support for research and science.

The *greatest* challenge, however, is to convince MRC scientists that the public need to know what is happening behind the academic walls. The organisational culture has to be shifted to fit the MRC’s strategic intent. Says Solomon (2000):

“While the need to engage the public is a global trend, and not just a South African or African idiosyncrasy, in this country, however, our point of departure for research advocacy is much lower than the Western countries. South African scientists are still quite loathe to interact with the public.”

How can communication between the MRC's scientists and the media and public be boosted? First off it had to be ascertained how the MRC's scientists felt about issues around communication and interaction with the media and public, what their attitudes and experiences had been, and how these had affected them. This would give pointers as to what needs to be dealt with and focused on in order to promote effective interaction.

Permission was obtained from The Wellcome Trust to use many of the questions from parts of their recent British survey commissioned from MORI (*The role of scientists in public debate*, 2000) in a postal survey of scientists at the MRC.

The objective of this survey was to provide a 'baseline' indication of the attitudes and experiences of MRC scientists in terms of communication of their research to the public and the media. This would inform development and implementation of strategies to fast-track a turnaround in culture towards promotion of science communication. It would also provide the first analysis of South African scientists' attitudes on the subject (there is a general paucity of information on how scientists themselves perceive increasing calls for them to become more involved in communicating their research to the public), and could also provide a template for future use by other institutions in South Africa.

The research aimed to find out what needs to be tackled in order to encourage MRC scientists to take a greater role in communicating their science, by asking questions such as:

- How do the MRC's scientists feel about the media, and interacting with them?
- What have their experiences of interacting with the media been like?
- Who do they think should have the main responsibility to communicate with the public about scientific research?
- What barriers do they see to greater understanding of science among the general public?
- What personal benefits or disadvantages do they see to communicating their research to the public?
- How satisfied have they been with media coverage of their work and why (or why not)?

The thesis comprises 9 chapters, the first being this introductory chapter serving as background to the study topic. Chapter 2 is a literature review outlining the role of the media in keeping the public informed about science and technology developments, and the relationship between scientists and journalists, highlighting the findings of three landmark studies. Chapter 3 outlines the situation in South Africa in terms of science communication, and Chapter 4 introduces the actual survey and its methodology. Chapters 5 to 8 outline the findings of the survey, often with extensive verbatim comments by the scientists, and Chapter 9 concludes the thesis and includes recommendations. Finally, references and appendices are attached.

2 Literature Review: Researchers, reporters, relationships and responsibility

Summary

The first part of this literature review outlines the role of the media as a critical conduit for enlightening the public about science and technology developments. Scientists are the gatekeepers in whose hands lies the responsibility to communicate their findings to journalists, so that they may reach the public at large. Media coverage of research (or lack of it) also impacts on which research decision-makers support. A closer, more co-operative relationship between scientists and journalists is vital for promoting coverage of science.

The second part of the review examines the state of the above relationship, highlighting the findings of three landmark studies exploring the attitudes of scientists towards the media and towards communicating their research in general.

“It is of great importance that the general public be given an opportunity to experience, consciously and intelligently, the efforts and results of scientific research. It is not sufficient that each result be taken up, elaborated, and applied by a few specialists in the field. Restricting the body of knowledge to a small group deadens the philosophical spirit of a people and leads to spiritual poverty.” -

Albert Einstein, quoted in Krieghbaum 1967: 14

From laboratory bench to park bench

Nearly everything we know now wasn't in any book when we were at school. The twentieth century will probably be referred to by future historians as the Century of Science. It was the century when we began to understand the universe in its entirety and to crack our own genetic code. When we walked on the moon and shrank our globe with supersonic travel, satellite

communication and the World Wide Web. When we were able to save millions of lives with antibiotics, and had the ability to take millions out with the atomic bomb. The twenty-first is set to turbo-charge scientific development - in health and medicine with the Human Genome Project as a spectacular starting-point.

Media fascination with science and especially with health issues has a long history: the first issue of the first American newspaper three centuries ago included two paragraphs on science - on public health and medicine (Krieghbaum 1967: 21). This fascination is alive and well today. *Time* magazine journalist Peter Hawthorne, at a media workshop held at the South African Medical Research Council (MRC) in September 2000:

“Health is one of the consuming human interest stories in the world, and medical issues come under intense scrutiny.”

Health is about *us* - it has a built-in attraction. So does biomedical research, which has been described as “making fundamental discoveries about what it means to be human” (King 1998).

Science exists in a world demanding greater accountability and relevance. The public has a right to be informed about scientific work carried out in research organisations which are largely publicly funded, even when commercial interests are involved (Gascoigne & Metcalfe 1997). Says *Nature* Editor, Phillip Campbell: “When science actually touches on people's lives it's self-evident that it must be accessible” (Gwynne 1997).

Not only good health but life itself may depend on communication of information. The US President's Commission on Health, Disease, Cancer and Stroke, February 1965: “It has been said that knowledge is power. In health, it is the power of life and death” (Krieghbaum 1967: 8). People need to be equipped to deal with the choices that new knowledge and technologies offer. Regulation and implementation of new technologies should reflect a smorgasbord of public opinion and involvement.

When it comes to the average person, there are few ways they can remain current in scientific developments after they leave school *except through the media*. Krieghbaum (1967: 5):

“... if the public is to make wise and intelligent choices, it needs to know its science now and the most accessible way for it to get this is from printed media, radio, television, and film.”

The media are a critical conduit to enlighten the public about scientific and technological developments (Hartz & Chappell 1997, Nelkin 1995, Krieghbaum 1967).

Nelkin (1995) spells out the role of science writers as 'brokers' framing social reality for their readers and shaping public consciousness about science-related events:

"Their selection of news about science and technology sets the agenda for public policy. Their presentation of science news lays the foundation for personal attitudes and public actions. They are often our only source of information about the scientific and technical choices that significantly affect our work, our health, and our lives ... For most people, the reality of science is what they read in the press."

Scientists themselves say they are hard put to stay up with cutting-edge research in their own specialties (Hartz & Chappell 1997). And when they try to understand a piece of scientific work, says Campbell, "scientists outside any discipline need just as much translation as anyone else" (Gwynne 1997). Freimuth *et al.* (2000) see the communication media as increasingly demystifying health data, enabling these data to claim their place in the marketplace as a public commodity.

Nowadays, quite rightly, accountability and relevance to the people who ultimately pay are major criteria in assessing scientific projects. Whereas before there was no obligation ("It's not my job"), now popularising science is part of the ethic and professional responsibility of scientists.

This shift is a major adjustment. As Professor Ian Lowe (2000), Honorary Professor of Science, Technology and Society at Griffith University in Australia, pointed out in his reminiscences:

"I remember Barry Jones, when Minister for Science, talking about the problem of persuading scientists to explain their work, 'In the lexicon of scientific abuse', he said, 'populariser ranks just above child-molester'. There was a feeling that you were letting the side down by explaining your science in terms that a non-expert could understand, almost as if you were a stage magician spoiling the illusion by disclosing the secrets of the trade."

A lot of scientists are beginning to use the media as a marketing tool - and many now seek to

use the media to project positive images and to foster public tolerance of their work. While a gleaming and visible public face may be seen as helping loosen the purse-strings when it comes to funding allocations, there is also growing recognition of the public's need and right to be informed. Sharon Dunwoody, head of journalism at the University of Wisconsin, Madison, USA, says the scientific culture is becoming much more savvy about the value of publicity. "In the 1970s scientists viewed media skill as equivalent to advertising," she declares. "Now they view it as good advertising" (Kreeger 1997). Leon Lederman, a Nobel laureate in physics, puts the point slightly differently: "Marketing is considered to be undignified," he says. "But who can do it for science apart from scientists?" (Gwynne 1997).

However, while some scientists now use press relations people to woo journalists, when journalistic coverage brings attendant public scrutiny, it's not so welcome! As far back as 1962 the American National Association of Science Writers' *A Handbook for Press Arrangements at Scientific Meetings* (Krieghbaum 1967) was pointing out that:

"Many scientists to this day question the 'popularization' not of research but of people as well as their research. They cannot accept the notion that the people are often just as important to the science writer and as interesting to the reader as research findings. Scientists, as newsmakers, are no different than statesmen, politicians, industrialists and others."

The media must serve as a communications channel not just for those in power or with money, but for all who have something to say. Hence reporters routinely interview not just the appointed 'spokespersons' for science, not just the heads of academies and laboratories, but also dissenters and critics. This practice frequently draws criticism, especially when it appears to grant legitimacy to eccentric or unproven theories (LaFollette 1990). One reporter described his job as including telling 'what the hell happens': "We are just reporting what the hell happens, whether it is a brilliant operation or doctors in a squabble among themselves. Both are news" (Krieghbaum 1957).

The basic fact remains that science enriches life, and is paid for by the taxpayer, who has a right to know. The public now have a great say in applications and practices in science, and base many of their choices on their own scientific knowledge (e.g. whether to take hormone therapy or not, how to react when children with HIV/AIDS go to school with their children).

In a democratic society the people make decisions, but in order to do so, the people need to be properly informed. So, if we think of science as a primary source of information about the world, then the media serve as a secondary source of information when they convey that information to the public. In between these two sources are the ‘gatekeepers’ - the scientists themselves. In their hands lies the vital responsibility of conveying their findings to journalists so that their research can make the transition from laboratory bench to park bench.

Science is going through a learning curve in terms of interaction with policy-makers and the lay public. In some instances, the policy-makers and the public demand answers to scientific and health-related questions – in others it is the professionals in science who must take the initiative to inform and educate.

Informing policy-makers will lead, hopefully, to better health, technology and scientific structures and practices. Informing the public about health research, for example, will lead to a greater awareness of health and scientific issues, which will hopefully lead to healthier lifestyles, but will also raise the level of civil awareness to encourage positive debate and interaction between researchers and the public.

Dr Neal Lane (1998), former Director of the US National Science Foundation, used to stress the importance of the role and responsibility of being a ‘civic scientist’ and engaging the public in a dialogue about science and society:

“In that exchange, the scientist offers a perspective of the contributions and value of science in society to a public interested but not very literate about science issues. At the same time, the scientist gains a grassroots understanding of the public's perception of societal problems and its expectations of how science can contribute to solutions.”

As Conn (1998), Editor of *Endocrine*, *Contemporary Endocrinology*, and *Recent Progress in Hormone Research* related in a recent speech before the Council of Biological Editors, this responsibility is self-serving, too:

“ ... the political agenda also dictates the national budget. Informed taxpayers, aware of the important biological advances – improved health and longer life expectancy – are our best allies. We have to communicate our message to the public, and it must be done in a compassionate, sensitive, and understandable way ... Remember, you are communicating

with voters (who pay for research), patients (who benefit from it), and children (who may make their lives' work of it)."

Pertinent health research data must reach the attention of appropriate decision-makers for them to be able to act on it, and most decision-makers - just like the public - often do not have degrees in epidemiology, statistics, or other highly technical fields. As the Global Forum for Health Research (1999) points out, international, national, and local media coverage of health research (or lack of such coverage) can have an enormous impact on what research decision-makers support.

Scientists realise that their professional colleagues will notice their work when it is featured in prestigious popular publications. Dunwoody says there is a " ... catalytic effect that always occurs when a major media organization like *The New York Times* pronounces something big news". Scientific papers that receive media coverage also receive more citations in the later scientific literature (Gwynne 1997). A 1991 report in the *New England Journal of Medicine (NEJM)* (Phillips *et al.*) compared the number of references in the *Science Citation Index* to articles in the *NEJM* that were covered by *The New York Times* with the number of references to similar articles in *NEJM* that were selected for coverage by the *Times* but did not appear because of a 3-month strike. Articles in *NEJM* covered in the *Times* received 72.8% more scientific citations than those selected by the *Times* but not covered. This greater attention was very marked in the first year after publication and remained evident in each of the 10 years for which citations were tracked. Heavily cited scientific articles are more visible to the scientific community than lightly cited ones. They conclude: "It appears that the direct transmission of information in the medical literature is enhanced or amplified by secondary transmission in the lay press" (Phillips *et al.* 1991: 1183).

To get into the media at all, science stories, like all other stories selected, are only accepted if they are *news* of some sort or another. Krieghbaum (1967: 174) reports findings from *Journalism Quarterly* showing that editors use substantially the same criteria for judging science news as the non-science readers use - and not those of the scientists, science writers or science readers. One person's news might be another's inconsequential fish and chips wrapping - the scope here is broad, as Krieghbaum (1967: 21) says:

"Science, like all the other information sources, has been mined to provide human interest

materials, vicarious thrills, and amusing anecdotes. Some news items have been exploited for propaganda or promotion. Still others have contributed to the laymen's education and background needed for informed decisions on public policy."

So, besides reporting on the results of scientific research, the media also gather news about social and political aspects of science, such as science funding, restrictions on research, copyrights and patents, and so on.

So important is media influence that in 1996 the prestigious medical journal *The Lancet* ran a special series on 'Medicine and the media'. In one article Vladimir de Samir from the Science Communication Observatory of Pompeu Fabra University in Barcelona, Spain, said:

"Mass media interest in health research is often regarded as a two-edged sword by the scientific community, who on the one hand will criticize journalistic lack of interest in important scientific query but then decry the style with which journalists report on research."

Points of contact between 'medicine and the media' include press conferences; news releases; interviews; media attendance at scientific meetings; and media summaries of journal articles, books, or electronic publications. Resnick (1996) analyses the reasons why scientists seek the media spotlight:

"First, they may view a discovery or finding as so important that they want the public to know about it as soon as possible. Medical researchers often have urgent news that can be of vital importance in preventing death and disease or in promoting human health. Second, they may wish to impress the public with their results in an effort to increase public support for science in general or for particular research efforts.

"Third, some scientists may want to release their results to the press to help establish priority. These scientists fear that they will lose their priority if they report their results through the normal channels, i.e. peer review, so they circumvent this slower process and take their results directly to the public. In many areas of research, priority gets linked to economic incentives, since in order to patent an invention one must establish its originality."

He alludes to the 'normal channels' or the route whereby scientific research is validated - by publication in peer-reviewed scientific journals. The media depend for much of their medical information on these scientific journals, such as the *NEJM*, *The Lancet*, the *British Medical Journal*, and the *Journal of the American Medical Society*. But these journals discourage openness by refusing to publish research that has already been presented to the public (Ingelfinger 1969, Angell & Kassirer 1991). All employ a rigorous system of peer review and

adhere to the 'Ingelfinger rule' developed by Franz Ingelfinger, former Editor of *NEJM*. Under this rule journals agree to consider papers for publication only if they have not been published already and are not being considered for publication elsewhere. The rule also mandates a news embargo on papers scheduled for publication.

As a result, medical researchers are usually unwilling to discuss their findings with journalists until after the research has been published in a professional journal. This impacts negatively on the access that reporters have to working scientists (Perlman 1992). Journalists who have heard of a certain study then find themselves unable to interview its authors (Altman 1996, Perlman 1992).

As the general public have developed a greater interest in health-related information and as competition for certain medical stories has grown more intense, this situation has begun to change. Says Joubert (2001):

"... many journalists have become more willing to publish research that has not yet appeared in a journal or undergone peer review. For example, a number of newspapers have run stories dealing with preliminary data presented at AIDS conferences and other scientific meetings, while others have published research sponsored by public interest groups or commercial concerns."

She adds that unfortunately in several cases the reported research proved to be of marginal or questionable value, and in some the alleged findings were simply wrong. In such cases, as Resnick (1996) states:

"Science's image suffers when scientific findings reported in haste turn out to be mistaken. ... [but] the social consequences of some research might be so important that the public needs to know about the research as soon as possible. If research can save lives, why let people die while peers review the research? Thus, while scientists should not circumvent the normal, peer review process in most cases, there may be some circumstances when social responsibility requires scientists to present their results to the press before their work has been peer reviewed thoroughly."

Ingelfinger notwithstanding, the job description of the scientist today has been irrevocably altered. No longer can they barricade themselves within the cloister of the ivory tower. As Haggerty & Rasmussen (1994) point out, those that have seen the light (TV lights?) realise

that in dealing with the media they are dealing with the public, and that communicating with the public about the research that the public has funded, is their responsibility.

Today the scientific process is often played out in the public eye (the ‘Dolly’ story, the ‘life on Mars’ story, etc.). “We are having a public conversation,” observes Erik Parens, associate for philosophical studies at the Hastings Center, a US bioethics research institute. It typifies the process of debate within an open, democratic society. “It might not be an elegant one at the moment, but that beats the hell out of the alternative,” says Parens (Kreeger 1997).

Publicly funded organisations such as the South African Medical Research Council (MRC) must be publicly transparent and must be seen to deliver what their mandate states that they will (see Chapter 4). Ideally the MRC should be an organisation with a number of notable examples of what journalism analyst Rae Goodell (1977) termed ‘visible scientists’.

A closer, more co-operative working relationship between scientists and journalists will enable scientists to help the media understand the larger scientific issues and their current and future impact, while journalists can help scientists understand how better to communicate and craft the message of their work.

What is that relationship generally like at present, and what can be done to improve matters?

Battling bedfellows

SCIENCE WRITER: “Why do you think that everybody who works on a newspaper has to be a bastard?”

DOCTOR: “Who wrote those God-damned headlines, anyway?”

From Kriehbaum (1957): *When Doctors Meet Reporters*

Many of the skills needed to be a good journalist are similar to those required to be a good

researcher: the ability to distill out the interesting aspects of a story when faced with a massive amount of information, not being afraid to ask questions, and being able to identify which questions to ask in the first place. On the face of it, then, one would think that science and the media are not strange bedfellows. As Resnick (1996) says, they both gather information, value accuracy and objectivity, and recognise their enormous social responsibilities.

Both scientists and journalists have their own professional standards and guidelines - and this is where major 'cultural' differences start to creep in. Nathan S. Haseltine, former medical writer for the *Washington Post*:

"Newspapermen and physicians live in their own worlds They see the same things, but each views them from his own training ... All this is neither praise nor condemnation of either profession. It just shows that the concepts and practices of medicine and of newspaper operations are as foreign to each other as the Eskimos and the Hottentots. The doctors and the news reporters go their separate ways, each wondering why the other is so strange."
(Krieghbaum 1967: 37)

Much of the literature seems to indicate that scientists and journalists come from two different planets - one characterised by painstaking and methodical assessment of data after close analysis over extended periods of time, the other wanting simple, direct, speedy snippets of information, uncluttered by qualifying statements. Bunk (1998) characterises the difference in approach as follows:

"Journalists thrive on the 'ah-ha'. We call it the angle or the hook to an article, an insight to make the information meaningful to nonspecialist readers. The reporter seeks to create a narrative line from selected facts. ...

Immersed in a continuum of discovery that constantly modifies what is known, scientists seek clarity through examination of all the known details. Complexity is their truth."

As a science writer at Krieghbaum's meetings between doctors and reporters (1957) put it:

"... there is scientific accuracy and there is newspaper accuracy. Scientific accuracy supplies all the details which are necessary to reproduce the experiment or explain the operation. Journalistic accuracy, on the other hand, is simply an attempt to convey an impression or a mood of what this means."

This difference in focus can indeed result in the two groups misunderstanding each other as much as Eskimos and Hottentots would if each were speaking their own language. Alton L.

Blakeslee of Associated Press, New York, quoted in Kriegbaum (1957: 49), pointed out another fundamental problem in the relationship:

“Our communications have faltered when either side assumed that the other should of course know things which it had taken him part of a lifetime and long training to learn.”

Add to this the fact that the two groups interact amidst a potential minefield of nuance and etiquette, and you have an explosive mix. LaFollette (1990) on some of the considerations bedeviling the relationship between these two ‘species’:

“There is a longstanding myth that information about science flows from laboratory to the public in some precise, formal way: that scientists publish and then journalists translate for the rest of us. In real life, science journalists learn about ongoing research as the ideas are forming, not just about the finished product. For the result to be accurate and fair, both reporters and their sources must possess extraordinary sensitivity to the status of the information involved. The reporter and scientist become locked in a symbiotic relationship, successful only when each reveres the truth - the scientist neither promising too much, nor revealing too little; the journalist describing the full extent of possibility without ignoring reality.”

Little research has yet been carried out exploring the attitudes of scientists towards using the media as a mechanism of communicating their research, and towards communicating their research in general. Understanding these better is a first, basic step in working out what to address and how to do so effectively, in order to encourage such communication. Three landmark studies in this area are outlined below.

Intergalactic warfare?

A one-year study surveying 1432 scientists and journalists confirmed that the two groups are ‘*Worlds Apart*’, the title the authors chose for their final report (Hartz & Chappell 1997).

While the authors state that “It is critical for scientists to reach out to the public and work with the media in increasing coverage of science,” their conclusion is that the public comes up short as a result of either no dialogue between scientists and journalists, or a dialogue only in name where the two groups “talk past each other.”

Both journalists and scientists must make changes if the level of communication between the two - and by extension, the knowledge of the public - is to improve, the Hartz-Chappell study stated. They found that the scientists were deeply distrustful of the media, while journalists thought scientists were a little arrogant and prone to using jargon:

- 91% of the scientists polled thought that few journalists understand the nature of science and technology;
- 76% of scientists believed the news media are more interested in sensationalism than in truth. Even many of the journalists surveyed (48%) said most reporters don't know how to interpret scientific results;
- at the same time, half of the scientists surveyed conceded that their overuse of jargon may be contributing to ineffective communication with journalists. Moreover, over 70% of these scientists admitted that they “often do not speak out and refute news coverage that is biased or inaccurate”;
- 75% of the scientists and 55% of the journalists complained that “most members of the public have no appreciation of the need to fund basic scientific research and development.”

One of the ‘most disturbing’ findings was the scientists’ negative perceptions of the news media:

- Scientists said the worst place to get news about science and technology was from local television news in America.
- Only 2% had a great deal of confidence in television - the medium from which Americans get most of their information.
- Fifty per cent expressed ‘only some’ confidence in TV news.
- Only 11% had a great deal of confidence in newspapers and magazines, and 67% had ‘only some’ confidence in them.

As Deborah Blum, a Pulitzer Prize-winning science reporter and now associate professor of journalism at the University of Wisconsin, is quoted as saying in the report, there are not enough science reporters, so frequently reporters with no background or understanding of science are thrown into stories, thereby contributing to the scientists’ perception that

journalists don't know what they are talking about. To help cure this she recommends that journalism schools include at least one course in science reporting in their curricula.

The scientists took part of the blame for shortcomings in science reporting:

- 50% said their use of jargon was a barrier to communicating effectively to the news media; and
- 81% indicated that they would be interested in taking a communications course.

In a statement to the Committee on Science of the US House of Representatives, the co-authors (1998) said:

"Scientists told us the news media oversimplify complex issues. Reporters said scientists didn't understand that 'news' is a perishable commodity and needs to be made relevant to the reader and viewer."

Both scientists and journalists were distressed by the low level of scientific literacy among the public at large, agreeing that the public is often confused and gullible. The co-authors found the US public poorly prepared to digest whatever science news comes their way - a 1996 National Science Foundation study reported that only 22% of 2006 adults could correctly answer at least 7 of 10 simple science questions. Less than half knew that it took the Earth one year to orbit the sun.

Hartz & Chappell (1998) point out that in the careers of most middle-aged scientists today, communicating their work was never given a high priority. In the words of Dr Neal Lane, they were told to go into their laboratories and do the things they do best - conduct science - and leave the talking about it to someone else. Hartz & Chappell (1998):

"Scientists pretty much did that, and along the way developed their own language. It is a very precise language, but is almost unintelligible to the average non-scientist. In fact, it is sometimes unintelligible to other scientists. The science culture developed a rigid system of reporting its findings and results in its own publications. While this served the science community very well, it left most laypersons totally in the dark."

Clearly, the public is interested in science and technology. Many surveys have shown this. And most scientists want the public to know about and appreciate their work. Hartz & Chappell

recommended that the scientific disciplines, through their associations and publications, strive to make their work more open and as user-friendly as possible. Suggestions included the following:

- Plain-language, peer-reviewed descriptions and translations of their scientific papers - publishers of science papers should require such summaries of findings, putting the work in perspective and indicating its importance and relevance in basic English.
- A system of flagging the most important work.
- Developing knowledgeable and articulate spokespersons to speak for each discipline.
- Co-ordinating their efforts on the Internet, giving journalists a peer-reviewed, reliable place to get current information for their science and engineering stories, also putting them in touch with spokespeople who would give commentary with accurate content.
- In co-operation with the media and higher-education establishments, more training of science and engineering communicators.
- Both scientists and journalists in mature careers to devote time to participating in workshops and continuing-education projects to better understand the needs and problems of each other's disciplines.
- Journalists should increase their understanding of and training in the sciences, specifically becoming familiar with scientific methods including peer review.

The most heartening finding was the massive interest (81%) from scientists in improving their communication skills. If each group takes the time and makes the effort to learn about the other, the public stand to benefit through greatly improved communication of research findings. And as Krieghbaum (1957) quotes one doctor as saying:

"If the *public* is constantly considered as the Number One responsibility of both medicine and the press, there should be little conflict."

Duelling down under

In a study examining the incentives and impediments to scientists communicating through the media, Gascoigne and Metcalfe (1997) collected information from 178 scientists from all the mainland states of Australia through a series of focus groups and a mail questionnaire. Most of

the scientists worked for CSIRO, a large national organisation with a brief to conduct wide-ranging research. Two focus groups were conducted in each city, one drawing participants who had little or no experience with the media, and the other using participants with wide media experience. The mail questionnaire was sent to 107 participants of ten media skills workshops run by the authors between August 1992 and September 1993 with 92 forms returned (86%), of which 75 were from CSIRO scientists.

The study examined questions such as what encourages scientists to communicate their work through the media? What incentives and rewards - for themselves, their programmes, their organisations - do the media offer? What discourages scientists from using the media? Are they adequately trained? Do they receive sufficient support from their organisation in terms of logistics and recognition?

The responses revealed a significant contradiction, and one very pertinent to all government-funded research organisations, including the South African Medical Research Council. Government, under increasing pressure to justify expenditure in an age of fiscal restraint, requires scientists to justify themselves in a public arena. But scientists are also under pressure: their organisations want them to gain additional funding from industry, and this sort of funding often carries commercial agreements which preclude public disclosure. What are appropriate policies for the government-funded research organisations? How can the public scrutinise research which is still substantially funded from the public purse, but shrouded in secrecy at the insistence of commercial partners?

The study found significant differences between scientists who did use the media, and those who did not. Those who did:

- saw significant advantages in having a media presence for themselves, their project, and their research organisation; and
- used the media as a tool in communicating their work to a variety of audiences, recognising that it is an imperfect but powerful method for reaching end users, research funders, bureaucrats and other scientists.

Scientists with little or no media experience saw their job in narrower terms:

- they tended to lack the political awareness of their media-experienced colleagues;
- they had far less trust in the media, thinking that it trivialises and distorts science;
- they were more likely to judge science stories in their own scientific terms rather than from the effect the stories would have on readers and viewers;
- commercial considerations were both a barrier and a shelter for these scientists.

Anxious not to offend sponsoring and collaborating groups from the private sector, and probably overly respectful of a company's desire for secrecy, they felt they had every reason to avoid the media.

Scientists with media experience felt that the responsibility for getting their message across was their own. But they were also more likely than their inexperienced colleagues to ask for assistance from communication specialists, seeing the role of the communicator as very important, partly for co-ordinating media output.

The untrained group generally felt it was the organisation's responsibility, not their own, to get stories into the media. They were more ambivalent about the role of communicators, some seeing them as important and others as a hindrance.

The Australian scientists felt that a major change of attitude was needed. They said:

"How to' deal with the media is only half of it. The organisation must 'want to' and individuals rewarded for doing so".

Media skills course graduates identified several ways their organisations could help them continue or expand their media activities. Most significant was providing more *time*, implying that media activities would have to be written in as part of their normal duties. Other ways included:

- more personal training in media skills;
- better access to communicators to assist them in getting their stories out; and
- recognition of media work in helping scientists gain promotions.

Emphasis on the publications record of scientists when promotions are considered, to the exclusion of other factors (like activity in the popular media), was seen as a barrier. It was felt that there should be weighting of several factors when it comes to promotions and the internal allocation of funds, and this weighting should give some credit for media activities.

The scientists found that media coverage of their work had significant benefits, but that their research organisations offered them little support and often greeted their efforts with indifference.

Lack of time will remain a significant barrier as long as scientists feel they would be better off spending time from their crowded schedules on preparing formal publications and that their employer does not value efforts in media work.

The authors spell out the implications for research organisations:

“It is a difficult period for governments all over the world. In an era of change and uncertainty they are carefully re-examining their priorities and spending commitments; and with incomplete information, trying to work out the best place to invest the shrinking amount of discretionary funds at their disposal.

“The media can be a powerful ally for science in these times. It is a legitimate tool in scrutinising and explaining scientific work to the public, and public opinion is taken into account when governments make decisions. Research organisations could make better use of the media to gain support, particularly as science is sometimes viewed with suspicion by a public which sees it as an elitist occupation.

“To do so research organisations would need to give formal recognition to the value of media coverage by including public communication in job descriptions and duty statements of research scientists at all levels. This means that the performance of individual scientists in public communication should be formally assessed in evaluation processes and taken into consideration in promotion cases.”

The authors say a cultural change is required before scientists will make more use of the media:

“It has to become an accepted, rewarded, recognised and legitimate activity, encouraged at the highest levels and actively promulgated through research organizations.”

Getting to grips in Great Britain

The Bodmer Report (1985), the report of a Royal Society ad hoc Group chaired by Sir Walter Bodmer, endorsed by the Council of the Royal Society, examined the state of public understanding of science and technology in the UK. One of its conclusions was that scientists need to learn to communicate with the public, learn about the media and have training in these areas.

Science communication issues are still very much on the agenda in the UK. Last year the government's science White Paper *Excellence and opportunity* (2000) was published, reflecting the conclusions of the House of Lords Select Committee on Science and Technology report, *Science and Society* (2000). The White Paper notes that the new emphasis in science communication should be on *engagement* between scientists and the public, rather than simply on education and public understanding.

For this reason, and in view of the fact that "Research into the field of 'public understanding of science' has tended to focus on identifying and understanding the views of the general public towards science. Little effort has been made to understand how scientists themselves perceive increasing calls for them to become more involved in communicating their research to the public...", the Wellcome Trust commissioned MORI to undertake a large-scale nationwide survey. This comprised face to face interviews with a randomly selected sample of scientists working in Great Britain, and was carried out between December 1999 and March 2000 (*The role of scientists in public debate* (2000)).

The survey was extensive - face to face interviews were carried out with a random sample of 1540 research scientists at higher education institutions and 112 scientists at 42 research council-funded establishments. Responses were unprompted, and in the case of open-ended questions were recorded verbatim.

The research aimed to investigate:

- whether scientists considered themselves to be the people most responsible for and best

- equipped to communicate their scientific research and its implications to the public;
- what benefits and barriers they saw to a greater public understanding of science; and
- what needed to change for scientists to take a greater role in science communication.

The survey found that the scientists think that the main sources of information the public use for information about scientific research and its implications are national newspapers and television. They also think that the public primarily trusts the media and those working for charities and campaigning groups to provide accurate information. However, the scientists themselves are most inclined to trust those working in scientific circles.

The vast majority of the scientists believed it is their duty to communicate their research and its social and ethical implications to policy makers (91%), and to the non-specialist public (84%). Many felt constrained by the day-to-day requirements of their job, leaving them with too little time to communicate - or even to carry out their research.

Scientists mentioned a variety of groups as being the most important to communicate with.

The top six were:

Peers/colleagues/fellow scientists	23%
General public/everyone/taxpayers	17%
Government/policy makers	13%
Industry	10%
Students/graduates/schoolchildren	10%
The media/press/TV	7%

For those with training in communicating with the public, the public came ahead of the scientific community as the most important group to communicate with (23%, cf. 15%).

Scientists at Research Council-funded establishments appeared to place greater value than average on communicating with the public and with government.

Most scientists (69%) felt that scientists themselves should have the main responsibility for communicating the social and ethical implications of scientific research to the non-specialist public. However, not as many (41%) felt that scientists were best equipped to do so.

Just over half of the scientists had participated in one or more of fifteen given forms of

communications activity in the previous year. They were most likely to have participated in open days and speaking at schools and colleges. This was followed by speaking to the media, then presenting, speaking, writing or publishing. While the majority (73%) said talking to national press and broadcast journalists was among the most effective ways of communicating their research, they had little trust in the media. The report says:

“This could explain why only a minority have actually spoken to the media themselves (in the last year) [29%], along with the usual constraints on their time.”

Only 26% of the scientists had contributed to public policy communications.

Participation in communications activity was related to scientists' skill and confidence: those who felt equipped to communicate the scientific facts and implications of their research and those who had received training were more likely to have done so. Three-quarters of the scientists felt equipped to communicate the scientific facts of their research, although only one in five felt very well equipped.

An overwhelming majority of the scientists had no training in liaising with the media (90%), or communicating with the non-specialist public (84%). Most were aware that their institution or department provided a range of communication services.

A wide variety of ways to improve communication were mentioned by the scientists:

- incentives from funding authorities to encourage time spent science communication (60%);
- training in dealing with the media (54%); and
- encouragement by institutions of time spent on science communication (53%).

Over half (56%) agreed that they would like to spend more time than they do communicating the implications of their research to non-specialist audiences.

The survey showed that there are perceived to be numerous benefits (both personal and for society) to better communication. It also highlighted several significant barriers, including:

- lack of time;
- lack of faith in the media;
- lack of training, support and encouragement to communicate with the public;

- lack of money or incentives.

Says the report (p. 46), reflecting the findings of the Australian survey:

“... these results suggest that a culture of communication with non-specialists is not yet widespread. ... Communication efforts need to be seen to be valued by institutions and research funders, and this needs to be reflected in increased time set aside for this purpose, and the existence of positive role models at all levels.”

I obtained permission from The Wellcome Trust to use many of their excellent questions from parts of their study in a survey of scientists at the Medical Research Council of South Africa, the results of which appear in Chapters 4-8 and Appendix II. Before overviewing this first extensive survey of the attitudes of scientists to the media and to communicating their research in South Africa, it is useful to outline very briefly the situation in respect of science communication in this country.

3 The South African scenario

Summary

In South Africa popularisation of science is seen as a key driver of socio-economic development. However, there are many hurdles to overcome. The science community in South Africa is unused to having to share its knowledge, while the South African media are largely inexperienced in terms of the intricacies of reporting science. The science, engineering and technology institutions of the country have been tasked with developing and strengthening processes to enable accelerated transfer and implementation of research findings.

“Communication professionals know that for real effectiveness you must know and understand your audience, but many South African scientists and science communicators have yet to learn how to meet their audiences half-way. Science communication is too often seen as a top-down flow from ‘expert’ to ‘ignoramus’ with little regard for the requirements of those on the receiving end. The cultural and educational diversity of our society, however, requires us to replace this ‘deficit model’ with a more participative approach where mutual understanding is the ultimate goal.” - from Joubert (2001)

A massive gulf between science and the citizen has certainly been very evident in our own country. In South Africa most science came of age during apartheid with its attendant aura of exclusivity, secrecy and elitism. Attention to public accountability was negligible. Funding was just fine around 10 (or even 5) years ago. So what if only a select circle of peers ever saw the results, little mind benefited from them?

As Marina Joubert (2001), head of science communication research and strategy at the new Foundation for Education, Science and Technology (FEST) and prime motivator for science communication in South Africa, points out in her excellent overview, the government of 1994

made the democratisation of science a priority, and promoted the popularisation of science as a key driver of socio-economic advancement. Democratisation of South Africa gave people the freedom to become familiar with all areas of public endeavour affecting them. However, the hurdles are considerable:

“South Africans were alarmingly disconnected from science and technology and ignorant of its potential benefits. The small scientific community had never before been called upon to share its knowledge. There was virtually no experience or leadership in the field of science communication. In addition, there were the logistical hurdles of limited resources, remote rural communities, 11 official languages and an illiteracy rate higher than 40%.”

The Department of Arts, Culture, Science and Technology (DACST) supports the assumption of many countries that technological change is the primary source of economic growth. DACST policies recognise as central concerns the two processes of innovation and technology diffusion, which are the agents driving development of science and technology and technological change. The government’s 1996 White Paper on Science and Technology states that “innovation has become a crucial survival issue”. A winning nation needs science and technology skills - and needs effective science, engineering and technology education and awareness to make South Africa competitive and able to contribute to sustainable development and improved quality of life.

Investment in higher education in science and technology is crucial. As David Potter, a South African who invented the world’s first palmtop, says “These skills are fundamental in building South Africa’s participation and competitive advantage in the global economy (and) in the knowledge economy. Unless this wide investment in South Africa’s human capital is applied, South Africa will not be able to climb the ladder in the economic competitiveness league of nations” (Singh 2000).

The South African public generally display low levels of scientific literacy. Kahn (2000) reports on a study indicating that around 50% of South African school leavers are scientifically illiterate, with gender and racial stratification in performance on the test. “Black students, females, even those holding identical grades to their white and other peers, score poorly.”

In March 2001 a national plan for higher learning education envisioning a 5% increase in student enrolment at colleges and universities with renewed focus on science and technology courses was released. A group of 75 independent schools including South Africa's biggest and oldest elite institutions plans to offer places worth about R15 000 a year to 500 black pupils who seem capable of passing matric higher grade maths and science. The move, which will cost the schools R5m, is a response to estimates that the class of 2000 produced only 400 to 500 black engineers, accountants and IT professionals. In a country of over 40 million, that is not much.

The system-wide review of science, engineering and technology institutions (SETI review) commissioned by DACST in 1997 indicated the need for the science councils in the country to develop and strengthen processes to enable accelerated transfer and implementation of research findings. The emphasis is on showing relevance and 'value for money' in terms of socio-economic development, in line with the priorities of the Government's National Advisory Council for Innovation (NACI).

With government funding now dwindling, the science councils and their scientists are having to compete in an increasingly politically charged funding arena. In respect of communication of their science Joubert (2001) says of the science councils, which are funded by DACST:

"Science councils are willing and committed at grassroots level, but often without the resources or the backing of their leaders. The councils must take responsibility for science communication, which should perhaps be included in their Acts (as is the case in the United Kingdom)."

In the USA the National Institutes of Health are mandated by the US Congress to share their research with the American public. Failure to be able to report back to Congress as to how they are communicating findings to the public could impact on future research funding received. In South Africa, however, there is as yet no such formal requirement of the science councils by government (although DACST is putting increasing emphasis on this aspect of the councils' performance) (N. Solomon - personal communication).

South African science has far to go in forging an effective relationship with the mass media in

science communication. There are few South African scientists who cope well with the media - and the South African media are largely inexperienced with the intricacies of reporting science. I quote at length from Joubert (2001), who effectively portrays the extensive challenges facing the South African scientist:

“Major stumbling blocks are the lack of expertise in science writing, and the lack of commitment to science by editors who do not believe that science sells newspapers. South Africa is driven by politics, obsessed with sport, and plagued by crime - and this material dominates our newspapers, radio and television.

“Few media outlets in South Africa have dedicated science desks. Science stories are often handled by junior or inexperienced general staff reporters without the skills, interest, or experience to do justice to the content. ... When a big story breaks, locally or internationally, our journalists are ill-equipped to handle it.

“At best, the South African media reports on ‘bread and butter’ science issues, mostly related to agriculture and the environment, and ‘life and death’ issues like malaria, AIDS, tuberculosis, heart disease and cancer. ...

“The South African Broadcasting Corporation is not the BBC and the *Pretoria News* is not *The New York Times*. Our science writers are poorly paid and cannot afford to invest the time to produce an in-depth story. The source (that is, the scientist or science communicator) must be willing to do all the legwork. Press releases now and then are inadequate, as few in the understaffed media environment can pick up a lead and run with it. The story has to be packaged at source, shaped, with ready-to-digest facts and figures, then marketed to the press. Our scientists need a better insight into how the media work. They must make it their business to build relationships with journalists and freelance science writers eager to publicise new research.”

“The South African media, furthermore, tend to view foreign science as (always) better than our own, so what little space goes to science news in the local press is often filled with straight downloads from international newswires. This is easier and cheaper than finding local science stories. South African scientists and science communicators have to wake up to the fact that we are competing for media attention and space with the rest of the world - and that foreign media make it easier for journalists to place their stories than the locals. Ironically, much cutting-edge scientific research from South Africa published in journals like *Nature* attracts media attention in London and New York, and is all but ignored in our own media.”

Garman’s (1998) limited survey of scientists at Rhodes University indicated that of the 26 respondents, 81% had experience of working with the media, but only 62% of those had been satisfactory encounters. (More than three-quarters of those who’d had satisfactory experiences said that it was either because they had written the copy themselves or had closely controlled

the whole process.)

At present, the University of Stellenbosch is the only one in Africa teaching science journalism - as an optional part of a postgraduate course. At the same time, South African scientists need communication skills. Says Joubert (2001): "A few courses exist, scattered around the country, but no sustained, well-resourced effort with follow-up to measure impact and effectiveness. No graduate course exists for science students wanting to specialise in science communication. The time is ripe for a graduate programme in science communication at our top research universities."

What do scientists in South Africa think about communicating their research to the public and other groupings? What do they think of the media, and what have their experiences of interacting with them been? A survey of scientists at the MRC, one of the science councils in South Africa, was carried out in an endeavour to find out - and to determine what may need to be tackled to promote effective interaction.

4 Survey of MRC scientists - attitudes to and experiences of reporting their findings to the media

Summary

The MRC's research needs to be communicated in order to evolve into health policy and to inform the taxpayers who fund it. Of the MRC scientists who responded to the survey, 48.9% had published more than 30 articles in peer-reviewed journals. However, 38.9% of the scientists had never had their journal articles mentioned in the lay media.

“The MRC’s research outputs need to be distributed strategically. If the research ends up in journals filed ceiling-high in archives or store-rooms and does not evolve into policy on health-related issues, or is not communicated to the general public, it becomes a wasteful and inefficient use of valuable resources – 60% of which are paid for by the tax-payer. Why, then, should the tax-payers even bother to give us this money?” - MRC Corporate Affairs Manager Nandipha Solomon (2000)

The relationship between scientists and the media, and scientists' attitudes to and experiences of reporting their findings to the public have not yet been documented in South Africa. Indeed, the feelings of scientists regarding disseminating their findings to the public have rarely been documented anywhere yet. “Little effort has been made to understand how scientists themselves perceive increasing calls for them to become more involved in communicating their research to the public...”, as The Wellcome Trust stated in its recent nationwide survey commissioned from MORI (*The role of scientists in public debate* (2000)).

I obtained permission from The Wellcome Trust to use many of the questions from parts of their study in a survey of scientists at the South African Medical Research Council (MRC).

The MRC has been described in *Nature Medicine* as “the best established statutory research body in sub-Saharan Africa” (Birmingham 1998), which outlined the recent history of the MRC as follows:

“ ... ten years ago it was a behemoth of an apartheid organization that was lumbering, top-heavy and without an effective program of internal research. And although every research organization, except perhaps the US National Institutes of Health, pleads underfunding, the problem in South Africa was serious enough to threaten the very basis of scientific research. However, in 1994, the new government brought with it a change in MRC leadership that proved to be so effective that the international review of South Africa's eight science councils [the SETI review] requested by the Department of Arts, Culture, Science and Technology in November 1997 declared: 'In the last three years, the MRC has undergone substantial transformation'.”

The SETI review committee was chaired by Alan Aderem, professor of immunology at the University of Washington, and recommended a four-fold increase in government funding for the MRC. This was based on evaluations of other science council budgets from which money could be transferred. “The money is there and would be well spent, but there are also programs that build houses, etc. who could also make a compelling argument to put their hands on this money”, Aderem said (Birmingham 1998).

The recommended new budget is now in place, with MRC funds topping R100 million for the first time in 1998. Its budget (2001/2002) is currently a projected R199 million, with baseline income from government an estimated R128.9 million, the rest being raised through contract research or funding from international sources. “The MRC is the only science council in the country with a growing budget through the commitment of government,” says MRC Board Chairperson 1994-1998 and its President since 1999, Dr Malegapuru Makgoba (*MRC News* 2001).

The MRC must be able to justify to the taxpayer, to DACST and to many other stakeholders why this money should be poured into it, as well as delivering - tangibly, transparently and visibly - on its mandate in terms of improving the health status of the nation.

The MRC's stated Vision is 'Building a healthy nation through research' and its Mission 'To improve the nation's health status and quality of life through relevant and excellent health research aimed at promoting equity and development'. The organisation is in a unique position to actively contribute towards socio-economic development from both a health and an economic perspective. Implementation of research findings should lead to significant improvements in the health status of the nation through publications, reports, policy recommendations, patents, products and processes. The economy gains directly by industrial development and job creation through the commercialisation of research outputs and indirectly through a healthy workforce and more efficient health systems.

Although the MRC performs exceptionally in terms of research outputs (publications, reports, patents), awareness of the MRC and its functions among the South African public is almost non-existent. The only direct communication with the public happens when research involves members of specific communities (e.g. trial sites, research relating to human behaviour, etc.). The challenge for the MRC is to commence engagement with the public to show, in a non-technical, layperson's fashion, that the MRC *is* "improv[ing] the nation's health status and quality of life through relevant and excellent health research aimed at promoting equity and development".

The importance of communication is emphasised throughout the *MRC Strategic Plan 1999-2002*. A few examples:

"The major lesson learned from the past is that the viability and prosperity of the MRC depends on our ability to demonstrate our relevance to our stakeholders and society at large. As health is everyone's business our research innovations, priorities and marketability are closely linked and impact on all." (*Introduction*)

"The MRC must be increasingly aware of the importance of and its accountability to stakeholders. The taxpayer (individual and company) is the major shareholder via the science vote and has the right to demand high-quality, up-to-date health information and value for money. It is important that the MRC demonstrates the value to society of public-funded health science and continues to improve its relationship with stakeholders through mutual understanding, communication and education." (*Vision and strategy*)

The Strategic Plan also indicates that ‘Stakeholder interaction’ is a specific strategic function of science, engineering and technology institutions that will be assessed by DACST in future SETI reviews.

The MRC needs to raise, improve and enhance its image and identity, and to increase public knowledge of and publicise its goals and objectives. It also needs to educate the public in order to enhance, within the MRC’s ambit, scientific literacy - or science for citizenship. This will facilitate, to an extent, the public debate which flows from an adequately informed base. The aim would also be to promote public support for research and science.

The greatest challenge, however, is to convince MRC scientists that the public need to know what is happening behind their academic walls. The organisational culture has to be shifted to fit the MRC’s strategic intent. Says Solomon (2000):

“While the need to engage the public is a global trend, and not just a South African or African idiosyncrasy, in this country, however, our point of departure for research advocacy is much lower than the Western countries. South African scientists are still quite loathe to interact with the public.”

As a first step towards shifting the culture of the scientists at the MRC in favour of communicating with the public and publicising their research, a survey was carried out to ascertain their attitudes to the media, their experiences of the media, and their attitudes to and experiences of reporting their findings to the public.

Objectives

The objective of the survey was to provide a ‘baseline’ indication of the attitudes and experiences of MRC scientists in terms of communication of their research to the public and the media. This will inform development and implementation of strategies to fast-track a turnaround in culture towards promotion of science communication. It will also provide the first analysis of South African scientists’ attitudes on the subject, these not yet having been reported to any great degree in this country. It could also provide a template for future use by

other institutions in South Africa.

The research aimed to inform what needs to be tackled for MRC scientists to take a greater role in science communication, by asking questions such as:

- How do the MRC's scientists feel about the media, and about interacting with them?
- What have their experiences of interacting with the media been like?
- Who do they think should have the main responsibility to communicate with the public about scientific research?
- What barriers do they see to greater understanding of science among the general public?
- What personal benefits or disadvantages do they see to communicating their research to the public?
- How satisfied have they been with media coverage of their work and why (or why not)?

Methodology

A questionnaire was drawn up using many questions from parts of the recent The Wellcome Trust/MORI survey (2000). (The questionnaire sent to MRC scientists appears as Appendix I.) However, the MRC survey differed considerably from the Wellcome survey in terms of methodology. The Wellcome Trust/MORI survey comprised face-to-face interviews (responses unprompted, and in the case of open-ended questions recorded verbatim) with a random sample of 1540 research scientists at higher education institutions and 112 scientists at 42 research council-funded establishments. The MRC survey was a *postal* survey of a significantly smaller sample size (253), with prompted responses. In the case of open-ended questions responses were also recorded verbatim. Any comparisons between these two sets of data must therefore be cautious.

The questionnaires were typeset in A4 booklet format comprising 20 pages and 52 questions, with plenty of room for personal comments to be written in. Scientists were able to indicate

their names if they wished, and whether their comments could be attributed to them by name.

Questionnaires were sent to every MRC-supported scientist in July 2000, 253 in all. A full list of MRC staff was obtained from the Human Resources department, which indicated all staff classified as 'scientists', including research trainees and research control technologists.

Questionnaires were mailed to 157 scientists from the HR database (including 12 research trainees), 23 MRC Unit Directors heading up MRC-supported specialised research units based at the various universities, and 73 so-called 'short-termers' who receive grants from the MRC to carry out self-initiated research projects at tertiary institutions across the country.

One month was given for responses, during and after which reminders were sent by putting notices in the MRC's weekly electronic newsletter, *MRC Newsweek*. (This does not reach short-term researchers, however, which may have impacted on their response rate.)

Demographics

Of the 253 questionnaires sent out, 100 were returned (39.5%) in time to be included in this report. The 100 was made up as follows:

Category	Sent	Completed	%
MRC intramural scientists*	157	54	34.4
MRC Unit Directors (extramural)*	23	23	100.0
Short-term grant recipients	73	22	30.1

* 'Intramural' and extramural scientists have since been combined into one inclusive MRC research portfolio.

Although the overall response rate of 39,5% was lower than desirable, the scientists completing the questionnaire represent an impressive assemblage of the MRC's researchers. For example, all of the MRC's Unit Directors at that stage - each of whom a world-class researcher and leader in their field - responded. In all, the responses represent a sizeable assembly of valuable information from most of the MRC's top research leaders. Their

educational qualifications, grade of position and number of articles in peer-reviewed journals reflect this (*see below*).

The scope of research carried out by the scientists covered the whole portfolio of research carried out by the MRC (Appendix II - The survey data). Each of the following research areas had 7% of the responding scientists working in them:

- Tuberculosis/respiratory and lung disease;
- Nutrition/malnutrition;
- HIV/AIDS;
- Malaria/geographical information systems;
- Effectiveness research/health systems.

Gender was fairly evenly represented with 42.4% female and 57.6% male respondents. (Of MRC 'intramural' scientists in 2000, 56.9% were female and 43.1% male.) Most of the respondents were in the 35-44 (35.0%) and 45-54 (33.0%) age brackets. (See Appendix II for full survey data.) Ninety-five per cent of the respondents worked full-time, and most of them were funded principally by the MRC.

In terms of grade of position, 45% were division head or higher:

- 10% head of department, school or institution
- 28% programme leader or director
- 3% sub-programme leader/assistant director
- 4% division head.

In addition, there were 22% specialist scientists, 15% senior scientists and 8% scientists. The remaining 19% were junior scientists or interns/students.

This was a very well educated bunch - 57.7% having a Ph.D., 21.6% a Master's degree and 10.3% an M.D. or M.B. Ch.B.

This reflected in the number of articles the sample had published in peer-reviewed journals:

1 to 10	29.2%
11 to 30	21.9%
30 +	48.9%

Almost half of the respondents had published more than 30 articles in journals - an impressive track record. However, most of them (38.9%) have never had their journal articles mentioned in the lay media:

Number of authored journal articles mentioned in the lay media	
0	38.9%
1 to 2	22.1%
3 to 5	13.7%
5 +	25.3%

5 Getting information about science out there

Summary

The scientists regard ‘the public’ and ‘policy makers’ as equally the most important groups that they should communicate their research to. Most of the scientists think that the non-specialist public are most likely to glean their knowledge of scientific research and its implications from the lay media. The scientists see ‘Little public understanding of what scientists do’ (59%) followed by ‘Lack of education’ (55%) as the main barriers to greater understanding of science among the public. ‘Lack of communication skills among scientists’ (53%) ranked third. Most feel that the main benefit of greater understanding of science among the public is that it ‘enables the public to make informed decision about their lives’. The two greatest *personal disadvantages* of communicating their research to the public are fears that ‘My research could be reported inaccurately’ (46%) and concerns that it ‘Takes too much time’ (43%). Although the scientists themselves don’t trust the media to provide accurate scientific information, they feel that the general public *do* trust the media to do so.

“It is a truism that promoting public understanding of science depends on scientists, not least because better appreciation of scientists - who they are, what they do, and how they do it - is critical.” - Monica Winstanley (1996) of the UK’s Biotechnology and Biological Sciences Research Council (BBSRC)

‘Public Understanding of Science’

In 1985 an ad hoc group set up by the Royal Society published a report entitled *The Public Understanding of Science* (known as the Bodmer report). Science pervades our society, it said, and our national prosperity depends upon it. Improving the public understanding of science is not a luxury, it declared, but “an investment in the future” (Broks 1996).

As the UK House of Lords Select Committee on Science and Technology report, *Science and*

Society (2000) notes, the new emphasis in science communication is on *engagement* between scientists and the public, rather than simply on education and public understanding. PUS should not be about more knowledge and more information (“like shouting English at foreigners”, as Broks (1996) puts it). What is needed is not greater understanding of science as product, but greater involvement in science as process - not the popularisation of science but the democratisation of science.

Not everyone agrees that effective popularisation of science affects research’s political fortunes. “What is the evidence that public support for science is related to public understanding of science?” asks Daniel Greenberg, editor of *Science & Government Report*. “There’s none.” Shirley Malcolm, director of education and human resources at the American Association for the Advancement of Science, agrees. “Public support is not necessarily related to public understanding of science,” she says. However, she adds, for non-scientists, “knowledge is personally empowering” (Gwynne 1997).

What was the MRC scientists’ understanding of ‘Public Understanding of Science’ (Q2)?

They were quite familiar with it. Illustrative of most of the responses is the following:

“The concept of science which the public can understand, conceptualise and appreciate and most of all identify with in daily activities”

Another scientist gave a cynical (but salient) response:

“How the layman interprets the media’s perception of what is ‘science’.”

One young postdoctoral fellow who has been in South Africa for 10 months, from Europe, seemed to have brought the climate of fear and misunderstanding currently pervading the relationship between science and the media overseas with her:

“A lot of badly written articles contributing to poor/misunderstanding of salient facts. Sensationalism and scaremongering.”

Two of the MRC’s Unit Directors were more expansive:

Prof. Ralph Kirsch: “This is a vital area. We need the public to be able to distinguish between scientific data/findings and garbage but we don’t invest in making sure they do!”

Prof. Tim Noakes: "The public needs to understand why science is important in improving their lives and the country's wealth, amongst others."

Who do the scientists think they should communicate their research to?

The scientists were asked who they thought was the *most important* group that they should communicate their research and its social and ethical implications to, and why (Q3 and Q4). 'The public' and 'policy makers' came out neck and neck as the most important, with 28.6% each:

The public (some specified women or mothers here, one felt it should be 'grassroots' people and others only the 'educated' public who could understand them)	28.6%
Policy makers/government/opinion leaders	28.6%
<i>A further 3% nominated both these above sectors together as most important here.</i>	
Peers/other scientists	10.2%
The media	9.2%

An additional 2% nominated scientists and the public together.

Other groups mentioned included health care workers/organisations (7.1%) and 'Educators and learners' (6.1%).

(As a matter of interest, The Wellcome Trust/MORI survey found that "Scientists at Research Council-funded establishments appeared to place greater value than average on communicating with the public and with government.")

It is interesting, however, that the public is jointly first selection as the most important group to communicate with, given the fact that most of the respondents' peer-reviewed journal articles have never been mentioned in the lay media. It is thus unlikely that much if any information about their research has ever actually reached the general public.

Comments made as to why the various groups were selected included the following:

The public

"Most scientific research in the end has its application for the general public, also to stimulate

an interest in scientific matters among the general public.”

“The research is meant for their benefit.”

“Health research impacts on every citizen of this country, not just a select few who may be knowledgeable.”

Both public & policy-makers

“Everybody is potentially affected [by infectious diseases] and more intense prevention needs to be applied.”

Policy makers

“So they can implement/use findings and recommendations based on scientific enquiry.”

“They can effect change.”

“Main implementers of my research recommendations.”

Peers

“Communicating with peers should be the first choice as this is where your work gets reviewed, criticised and developed. Before communicating to the public all scientists must be in agreement or else the public receives mixed messages resulting in confusion and frustration.”

“Individual research results become fact when scientists regard it as such.”

“Acceptance by this group central to achieving credibility.”

The media

“They are the conduit between scientists and the public.”

“Reach the largest proportion of the population.”

It is indeed important that scientists communicate across a number of different groups, as Joubert (2001) has pointed out, for all the reasons mentioned above, and more.

Only a few of the scientists think that the groups they selected are very knowledgeable about the science of their area of research (Q5), or the social and ethical implications of it (Q6). Only 10.7% of those who chose the public as the most important group to communicate with thought the public was ‘very knowledgeable’ about the science of their research. Of those that selected policy-makers/government, only 14.8% thought they were ‘very knowledgeable’ about their science. None thought the media were very knowledgeable about it:

Science

	Very kn.	Fairly kn.	Not very kn.	Not at all kn.
Public	10.7%	17.9%	46.4%	25.0%
Policy-makers/government	14.8%	37.0%	44.4%	3.7%
Media	-	33.3%	33.3%	33.3%

Similar results were obtained regarding the groups' perceived knowledge of the social and ethical implications of the scientists' research, with again none regarding the media as 'very knowledgeable':

Social and ethical implications

	Very kn.	Fairly kn.	Not very kn.	Not at all kn.
Public	7.1%	10.7%	71.4%	10.7%
Policy-makers/government	18.5%	40.7%	33.3%	7.4%
Media	-	44.4%	55.6%	-

Barriers and benefits to greater understanding of science

What do the scientists see as the main *barriers* to greater understanding of science in general among the non-specialist public (Q8)? Top here was the belief that there is 'Little public understanding of what scientists do' (59%), followed by 'Lack of education' (55%). (These were also seen as the main barriers in The Wellcome Trust/MORI survey.)

Interestingly, 'Lack of communication skills among scientists' (53%) ranked third highest of the list of 16 options. 'Insufficient media coverage' and 'A lack of appreciation of how science affects them' were both selected by 50% of respondents. Comments here included:

"Lack of continued exposure. Media sporadic in their reporting on science."

"Scientific info. not presented in an interesting, relevant and easy to understand way."

"Too few science journalists."

"Scientists' attitudes and preferences and priorities (non-specialist public are seldom targeted. Scientific information is primarily fed back to the 'science' population)."

One scientist reminds us of the reality of life for many South Africans:

"Their personal struggle for survival eclipses all other problems."

Eighty-one per cent of respondents felt that the main *benefit* of a greater understanding of science among the non-specialist public (Q9) was that it 'Enables the public to make informed decisions about their lives'. The next four ranked responses were:

Policy-makers and decision-makers are better equipped	64%
Enables the public to judge science issues for themselves	59%
More people entering science education/science careers	55%
Better knowledge/understanding of science is a benefit in itself	53%

The top *personal benefit* of communicating their research to the public (Q10) was seen as 'Advancing the role of science' (65%). Respondents made many altruistic comments here:

"Promotes implementation of (what I believe to be) appropriate policies - 'job satisfaction'; promotes social justice."

"Assist the public and other professionals in making informed decisions; making me feel good about contributing to society."

"It makes me feel my findings are getting 'out there' and stand a greater chance of improving someone's health."

The two greatest *personal disadvantages* of communicating their research to the public (46% and 43% respectively), were fears that 'My research could be reported inaccurately' and concerns that it 'Takes too much time'. Comments around these themes varied:

"Media commonly misrepresents research - sensationalises."

"It can take a very long time and it doesn't advance your career/get you funding/get peer-reviewed publications, etc."

"Expose oneself to unfair criticism, undue judgement - influence relationships with collaborators if results reveal negative aspects."

"Public expects absolute answers from science, which are usually not possible."

"There is no clear message from the MRC about actively encouraging their scientists to give up some of their time to PUSSET activities."

Two scientists raised concerns that the fact that they worked with animals in their research

would result in negative publicity for them.

The themes of not getting recognition for communicating their research to the public, and not being encouraged to do so by the MRC come through quite strongly. This is discussed further in chapter 8.

Where do people get their information from - and who do they trust?

The scientists recognise that the non-specialist public (with no specialist knowledge of or training in science) are *most likely to glean their knowledge of scientific research and its implications from the lay media (Q7)* than from scientific journals or even information published by bodies such as the MRC, or the ‘popular’ science press. Eighty-six per cent of respondents thought the public got their information about scientific research from local newspapers (e.g. *The Cape Argus*), 81% that they got it from general interest magazines and 78% from national newspapers (e.g. *The Sunday Times*). Sixty-six per cent saw television news as one of the public’s sources. Only 10% thought the non-specialist public got such information from material published by bodies such as the MRC or CANSA, 6% from the ‘popular’ science press (e.g. *New Scientist*) and a mere 1% from scientific journals.

While the public may be one of the most important groups to communicate their findings to, the scientists realise that the public aren’t going to be unearthing material in scientific journals - which is the only medium most of the respondents’ work has been mentioned in.

In South Africa poverty and remote locations mean that many of the public may not have access to the forms of media deemed used. According to journalist Charlene Smith (2000), the South African Broadcasting Corporation says radio transmits to around 85% of the country, while 30% either cannot afford a television set or cannot receive a signal.

As Dr Himla Soodyall commented in terms of Q7:

“This is a difficult one to call, considering the people who would be interested in the research I do [about genes and disease] may not have ready access to this type of media.”

Even if they do have access, are those media used to convey science?

Dr Elly Grossman: "I believe the greatest source of 'information' in Africa is the radio; do the programmes the public listen to convey topics about scientific research? I doubt it!"

Who would the scientists themselves generally *trust to provide accurate information about scientific research facts* (Q49)? From their responses it is apparent that they generally trust other scientists with this task. Their top three options selected were:

MRC	81.0%
Scientists in universities	77.0%
Science books written by scientists	62.0%

They don't trust scientists in just any sector though - 'Government scientists' (18.0%) and those working for pharmaceutical companies (16.0%) only fared marginally better than 'TV documentaries' (15%), as did 'Government advisory bodies' (17%). There is obviously a credibility gap between MRC scientists and government. [And this response was obtained before the much publicised controversy around SA President Thabo Mbeki's stance regarding HIV and AIDS.]

Journalists working for national newspapers were selected by a mere 5.0% as being trusted to provide accurate information about science research, although journalists working for the popular scientific press (e.g. *New Scientist*) fared considerably better at 44.0%.

The trend in terms of responses as to who they would generally trust to provide accurate information about the social and ethical implications of scientific research (Q50) was similar.

Given the same list of sources of information, which did they think the general public would generally trust to provide accurate information about scientific facts (Q51)? Again scientists were selected as most trustworthy with 'Scientists in universities' (70.0%) and MRC (69%) topping the list (government scientists and advisory bodies rated 35% and 32% respectively).

The public might be deemed to trust MRC scientists, but are not deemed likely to obtain their information about science from MRC publications, but rather from the lay media (Q7). And although scientists themselves don't trust the media to provide accurate scientific information,

they feel that the general public *do* trust the media to do so:

Trust to provide accurate scientific information	Public	Scientists
TV documentaries	58%	15%
TV news and current affairs programmes	56%	8%
Journalists working for the popular scientific press e.g. <i>New Scientist</i>	51%	44%
Journalists working for national newspapers	43%	5%

In terms of providing accurate information about the social and ethical implications of scientific research (Q52), it was felt that the general public was again most likely to trust the MRC (56.0%) and ‘Scientists in universities’ (52.0%). The media fared as follows:

Trust to provide accurate information about social and ethical implications	Public	Scientists
TV documentaries	48%	14%
TV news and current affairs programmes	46%	7%
Journalists working for the popular scientific press e.g. <i>New Scientist</i>	43%	32%
Journalists working for national newspapers	38%	7%

So if the non-specialist public trust MRC scientists as a source, but are most likely to gain their information about science from the lay media, getting more information from MRC scientists into the lay media would be one way of getting more information about the MRC, its scientists and its research to the general public of South Africa, who pay for it.

6 Communicating the scientists' own research

Summary

In terms of communicating their research and its implications to the non-specialist public:

- 56.7% of scientists strongly agree and 36.1% tend to agree that scientists have a duty to do so;
- 25.3% strongly agree and 45.5% tend to agree that they would like to spend more time doing so;
- 70.0% feel that scientists themselves have the main responsibility for communicating the social and ethical implications of their research;
- most of the scientists believe that talking to the national (71%) or local (61%) press or TV and radio journalists (60%) or speaking on TV/radio (59%) are effective methods of communicating their own research and its implications to the public; and
- 55% feel fairly well equipped and 22% very well equipped to personally communicate the scientific facts of their research to non-specialists.

However, the scientists tend to agree that the day-to-day requirements of their jobs leave them with too little time to communicate the implications of their research to others (47.5%) or even to get on with research (36.4%).

Ritchie Calder (now Lord Ritchie of Balmaslanner), who as a young reporter went to see Lord Rutherford, father of Nuclear science, at Cavendish Laboratory, Cambridge. *"I was trying to persuade him to help me to explain the nature of the nucleus to my 2,000,000 uninformed newspaper readers. He was scornful. He said they could not possibly understand. When I persisted, he opened the drawer of his desk, took out a manuscript of one of his latest papers. It was covered with hieroglyphs which I could not begin to understand but I pretended to study it, leaving him fretting for ten minutes at the other side of the desk. Then I took out my shorthand notebook, with the verbatim notes of a lecture which I had reported the night before. I threw it across the desk to him and said: 'Lord Rutherford, I'll do a deal with you. You translate my shorthand and I'll translate yours. There is no more reason why I should understand*

your grammalogues than you should understand mine.' Fortunately he had a sense of humour. He roared with laughter and settled down to give me a perfectly lucid, entirely comprehensible account of the nucleus which my 2,000,000 readers could understand." (From Kriegbaum 1957: 101-102.)

Duty and responsibility

Of the respondents, 56.7% of respondents 'strongly agree' that scientists have a *duty* to communicate their research and its implications to the non-specialist public (Q12). A further 36.1% tend to agree with this. Most also tend to agree (45.5%) or strongly agree (25.3%) that they would like to spend *more time communicating* the implications of their work to non-specialist audiences. They also tend to agree, however, that the day-to-day requirements of their job leave them with *too little time* to get on with research (36.4%), or to communicate the implications of their research to others (47.5%).

If efforts put into communicating with the public were given formal recognition in their performance assessments, scientists would possibly be more inclined to apportion more time to this endeavour in their busy schedules.

Most of the scientists strongly agree (47.5%) or tend to agree (28.3%) that they should only publish their findings when they have been peer-reviewed. Dr Himla Soodyall:

"The scientific content ought to be peer-reviewed first, and then communicated to public in format that is understandable."

Most also strongly agree/tend to agree that funders (41.4%/41.4%) and professional communicators (30.3%/45.5%) should help them to communicate their findings to the public.

The majority of the scientists either strongly agree (57.1%) or tend to agree (33.7%) that the public needs to know about the social and ethical implications of their research (Q23). They also overwhelmingly feel that it is *scientists themselves* (70%) who have the *main responsibility* to do this (Q24). The next highest scoring option was 'Specialist science communicators' (49%), and then the funders of scientific research (35%).

Some of the comments given as to why they chose the various options as having the main responsibility:

Scientists themselves

"They are doing the research and are experts in what they do. They are better able to explain and answer questions about their own work"

"The main onus is with us! After this the others may be chosen on the basis of how effective they are"

"Scientists themselves must be seen to take responsibility for the results of their work; the other groups can/should assist scientists in getting information to the non-specialist public."

"Scientists should not proceed with work assuming it can occur in a vacuum, divorced from broader implications. They should think about these themselves and then they will be in the best position to communicate them."

"Scientists are best equipped to supply accurate and appropriate information."

"Scientists as they know and understand the facts and they should work with the journalists to translate their facts into journalese for the public"

Specialist science communicators

"Ideally, a specialist science communicator would present the facts and arguments and let the public form their own conclusions"

"The scientist-journalist link is the most direct route of communication"

"They understand the scientific process"

"They have special training in bridging the gap between scientist and public, avoiding jargon, etc."

"It should be those who know the facts (scientists) and those skilled in interpreting and communicating these facts (communicators)"

Funders of scientific research

"The funder of the particular research topic" because "This is the main stakeholder in the topic."

"Not only the scientist has the responsibility to inform the public, funders as well as reporters should also carry the responsibility."

"Government is accountable for its use of public money, scientists are too."

One senior researcher said that scientists and specialist science communicators have the responsibility because "Complex issues will be best dealt with by persons directly involved".

However, this scientist makes the additional comment that “Scientists do *not* have the time to communicate with public/media. A time-saving device/person will improve matters.”

Another top-ranking scientist cited politicians, government, funders and journalists because “they are responsible to the people”. He obviously doesn’t see scientists in this light. Another top scientist chose just about every category *except* scientists saying of the others “Its part of their job”.

Communication methods - and confidence

In line with their responses to Q7, recognising that the non-specialist public is most likely to glean their knowledge of scientific research and its implications from the lay media, most of the scientists believe that talking to the national (71%) or local (61%) press or TV and radio journalists (60%) or speaking on TV/radio (59%) are *effective methods of communicating their own research* and its implications to the public (Q13). These are also seen as the *most effective* tools for doing this (Q14), but with a slightly altered order: speaking on TV/radio (55%), talking to TV or radio journalists (45%), and talking to the national (46%) and local (35%) press.

This was also reflected in their communication activities over the past year: 44% had spoken to national newspapers and 40% to local ones, and 35% to TV or radio journalists. Twenty-nine per cent had spoken on TV or radio. The only other option coming close to these was ‘Presenting at events other than scientific conferences for scientific professionals’, with 31% having done so.

In terms of communication activities around public policy, 40% said they had contributed to a response by their institution to a government advisory body or parliamentary select committee, and 50% that they had contributed to a technical or policy brief aimed specifically at informing decision makers (Q16). Forty per cent indicated that they had written for non-specialist audiences about their research in the past year (Q17A).

The scientists are quite confident about *personally communicating the scientific facts* of their research to non-specialists (Q18): 55% felt ‘fairly well equipped’ and 22% ‘very well equipped’ to do so. Twenty one per cent felt ‘not very well equipped’ and 2% ‘not at all equipped’ to do so, however. One person marked ‘fairly well equipped’ as well as ‘wouldn’t personally do this’, commenting that they were “Not very interested in doing this though able”.

The scientists are generally confident about personally communicating the social and ethical implications of their research to the non-specialist public - 53.1% felt ‘fairly well equipped’ and 16.3% ‘very well equipped’.

While most of the respondents felt that scientists themselves have the main responsibility to communicate the social and ethical implications of scientific research findings to the non-specialist public, when asked who was *best equipped* to do this, scientists again scored highly (45%), but were pipped at the post by ‘specialist science communicators’, with 52% choosing them (Q25).

Commented MRC Unit Director Prof. Ralph Kirsch: “Scientists should be but often are not. Media, once properly briefed, will do a good job but one has to work with them!”

Journalists were next in the rankings but selected by only a fifth of respondents: ‘journalists in the national press’ (21%) and ‘journalists in the broadcast media’ (20%).

Although the scientists see ‘specialist science communicators’ as best equipped to communicate the social and ethical implications of their research, and as second to the scientists in terms of the main responsibility of doing so, in South Africa the reality is that such ‘science communicators’ can probably be counted on the fingers of one hand.

With not enough science communicators to take on the responsibility, it is up to journalists (and again, as discussed in chapter 3, there are very few ‘science journalists’ in South Africa) to find some way of presenting the world of science to the public in an intelligible format. Journalists and scientists both have a responsibility to educate and inform the public in order to

avoid misinterpretations and misapplications of science. The scientists are the gatekeepers to the research findings. Only through them can this trove of information be unlocked and revealed.

7 Communicating with the media - scientists' experiences and attitudes

Summary

Most of the scientists had either never had any contact with the media or only every few years. Twenty-two per cent were being interviewed or written about several times a year, and 6% once a month or more. When their work (or themselves) had been the source or subject of a news story, most (65.4%) indicated that they had been either 'very satisfied' or 'somewhat satisfied' with the coverage. However, they did not rate general coverage of science and technology in the media very highly, and most also rated the journalist that covered them as 'not very knowledgeable' in terms of general knowledge. Many comments about coverage of their work and about the media in general reflected unrealistic expectations, which can only be addressed by training the scientists in what the media are all about and what the media expect. The overwhelming majority of the scientists (86.9%) had never had any training in dealing with the media, but 80.8% would be interested in such training if the MRC provided it.

“The best way to for scientists to avoid being misquoted or quoted out of context is to cooperate with the media and give extensive, in-depth interviews. Interviews give scientists a chance to explain abstract concepts and theories and technical experiments and procedures. Scientists can stress their key ideas, interpret them, and place them in a broader context. By educating and informing the media, scientists increase the probability that their results will be understood and accurately represented and that they will not be quoted out of context. ... Academicians who view their work as so ‘deep’ or ‘important’ that it should not be ‘watered down’ for public consumption risk becoming irrelevant, ivory tower, snobs.” - Resnick (1996)

To recap: the majority (70%) of the respondents feel that scientists themselves have the main

responsibility to communicate the social and ethical implications of scientific research findings to the non-specialist public (Q24), and 56.7% 'strongly agree' that they have a duty to communicate their research and its implications to them. They also view 'the public' as one of the most important groups that they should communicate their research to (Q3 and Q4) ('the public' and 'policy makers' neck and neck at 28.6% each). The scientists also recognise that the non-specialist public are *most likely to glean their knowledge of scientific research and its implications from the lay media* (Q7).

So, have they been talking to the media about their research? How do they feel about the media, and about the media's coverage of their work, if any?

Fifty-six of the 100 respondents indicated that during the past year they had personally talked to the press or media about research in their field (Q27A). Fifty-five scientists responded to an enquiry about how many times they had done so (Q27B), with a mean of 7.5 times. A few high fliers had spoken to the media on a regular basis - e.g. a researcher heading up HIV/AIDS research had done so 100 times in the year, and another who researches exercise and sports science had a weekly radio slot.

How often had the scientists been interviewed or written about in a science news story (Q28)?

Results showed that most had very rare contact in terms of science news coverage:

More than once a month	3.0%
About once a month	3.0%
Several times a year	22.0%
Once a year	19.0%
Every few years	29.0%
Never	24.0%

Most had either *never* had any such contact or only *every few years*. Looking on the positive side, 22% were being interviewed or written about several times a year, and 6% once a month or more than that.

Many of the scientists had indicated (Q12) that they felt that the day-to-day requirements of their job left them with *too little time* to get on with research (36.4%), or to communicate the implications of their research with others (47.5%). In terms of responding to enquiries from the

press or media, only 9% felt that they had ‘frequently’ had difficulty responding to the volume of enquiries, and 11% had occasionally had difficulty; 20% and 24% respectively had rarely or never had difficulty (Q33).

Comments about coverage

The scientists did not rate general coverage of science and technology in the media very highly (Q26). While 43.2% said coverage on the international channel or programme that they watched most often was ‘good’ (and 8% ‘excellent’), only 7.4% judged coverage on the national television news as being ‘good’ (and none as ‘excellent’). This is very low indeed, indicating a serious lack of confidence in the national media. National newspapers (19.8% ‘good’) and radio broadcasts (12.1% ‘good’) also fared rather badly. Local newspapers (18.7%) and radio (9.2%) likewise.

How satisfied were those whose work (or themselves) had been the source or subject of a news story, with the coverage they received (Q29)? Most (65.4%) indicated that they had been either ‘very satisfied’ or ‘somewhat satisfied’ with the coverage:

Very satisfied	8.3%
Somewhat satisfied	57.1%
Neither satisfied nor dissatisfied	14.3%
Somewhat dissatisfied	16.7%
Very dissatisfied	3.6%

The respondents were prompted to indicate why they had felt the way that they did (Q30).

Most of their comments are reflected below:

Very satisfied

- “It reflected accurately what I said and felt.”
- “There appears to be a sense of appreciation for my work from the lay public”
- “Research is appreciated. People may read it, public may respond.”
- “The journalist took great pains in getting the facts accurately”
- “Feeling of relevance, feeling of making a contribution”

"The reporter allowed me to read what she had written and to correct her"

Somewhat satisfied

"Although the reporting is often factual, the headlines can be misleading"

"Inaccuracies in factual content of coverage; lack of attention to the implications of the research; coverage very 'sporadic', i.e. little follow-through, etc."

"Lots of post-interview editing by reporters etc., and sometimes changing sense of what was said. Also, background knowledge of interviewers very poor - inadequately prepared to conduct interview, given their means of access to information via electronic medium"

"Generally accurate. But media tend to say things in a funny way and focus on things that are sometimes not really important. They often miss the actual point while trying to sound exciting. Or stirring up controversy."

"Most instances the work is portrayed so light and simple that it loses its true value"

"When a story is made readable to the public it inevitably loses something"

"Ignorance from the journalist! I had to approach them about a possible story then they seemed to be reluctant to produce an article. They wondered about relevancy!"

"Coverage was complete and journalist checked accuracy before publishing"

"Journalists often do not understand the nuances of what they write - may be incomplete attention to detail. Also, they often/always wish to sensationalise some aspect of the work and so lose balance"

"In my case the reporting was adequate."

"Accuracy of reporting varies. Journalists do not always come back to check the accuracy of their stories even though they promise to do so. One international journalist made an extremely shallow analysis of our research and misunderstood entirely the developmental needs facing South Africa. However, other journalists can be very good."

"Story is often not fully told, sometimes *over-simplified*".

"Reported accurately"

"The emphasis is not usually what I would give to the article - I request articles so that I can correct the scientific errors which are numerous and horrific"

"My Ph.D. work was discussed on the TV programme *50:50* by a knowledgeable scientist but not an expert in my field"

"There should have been greater coverage".

"The media reported the results correctly although their wording emphasised the wrong points to a certain extent. It was really what they felt should be emphasised."

"In most radio/TV cases one has little control over the final material. One can control live interviews and press interviews (I only agree when promised editorial rights). By and large one is satisfied."

"Press tends to lift our press statement verbatim - no critical analysis. TV prefers sound bites,

could quote you out of context.”

“Often misquoted and/or misrepresented. The standard of scientific journalism locally is poor - with some notable exceptions.”

“Usually journalists stick to the press release or quote verbatim. Occasionally they get it terribly wrong, e.g. announce the release of an MRC report which doesn't exist when all I had done was quote a few figures or announce the release of 'new' data which is 5 years old.”

“Because the person who wrote my side of the story checked the information with me before publishing it”

“They wrote what they were told”

“Reasonably accurate and gave the research publicity”

“Incomplete reporting”

“It covered the facts about my work”

“The message was clear and at a level which is understandable to most people reading that specific magazine.”

“The coverage was good generally. The journalists sometimes quote me out of context to make their point.”

Neither satisfied nor dissatisfied

“Often fail to grasp 'meat' of matter”

“Because the press has a way of misquoting me - I was misquoted”

“Journalists had changed the story resulting in a shift of emphasis”

Somewhat dissatisfied

“There is a great deal of editing for TV coverage or interview (including radio) and the message one tries to convey can get distorted. Sometimes the most important aspects are ignored for the ones with the most popular appeal”

“Editing often picks a point of lesser importance. Exposure is too short to be meaningful”

“There were often inaccuracies or some misquotes, sometimes a hint of sensationalism.

Quotes totally out of context. On TV spots one is of course disappointed by the brevity - although I do realise that is inevitable! However, it often seems that the only bit quoted is not the main message that the scientist wants to get across - it's what the interviewer wants.”

“They concentrated on sensation, instead of on findings”

“Lack of time by the journalist, never seen final draft before press (unacceptable!)”

“The information is edited in a manner which can have different meanings”

“Two parties (media and myself) had completely different agendas. I have been misquoted, quoted without permission, without prior warning and not enough time”

Very dissatisfied

"Anonymity of participants compromised; results of research sensationalised, almost blown out of proportion"

"The story tends to be twisted according to the needs of the newspaper"

"Misquoting me - usually as a result of the editor 'jazzing up' the story to make it more newsworthy"

Comments under 'somewhat satisfied' made up the bulk of the responses. The scientists seem to be hard taskmasters in some instances, indicating that they are only 'somewhat' satisfied even when everything seems to have gone well. Even among the 'somewhat dissatisfied' comments, some of them reflect that the media were merely doing their job - which sometimes will entail not meeting the scientists' needs in order to meet the public's. As Howard (2000) puts it:

"So much of scientific training dictates meticulous description of methods, a discussion of findings, assessment of validity, and statement of conclusions. But when the message is delivered to the public, communication must address the public's concerns not the scientist's."

Scientists certainly shouldn't hold popular science journalism to the standards of formal science writing - otherwise it will always be found wanting. The popular media have very different criteria, needs and aims, which the scientists should understand in order to get their message across as effectively as possible. Haggerty & Rasmussen (1994) point out how sources who don't understand the media may feel intimidated by them - they feel that the media ought to be under their control and if not controlled they must be the enemy. Such sources also tend to feel that journalists should run their news release "the way I said it" - if it has been rewritten or edited at all they tend to feel the quotes pulled from it are out of context. Quoting from other sources who disagree with them is unlikely to be seen as balancing a story!

At a workshop held at the University of Stellenbosch on 4 March 1999, Sharon Dunwoody, Professor and Director, School of Journalism and Mass Communication at the University of Wisconsin-Madison, said that when scientists talk about errors or inaccuracies in news reporting, studies have shown that they are often referring to issues of judgement. Errors noted are often those of omission rather than of misstatements of fact. When scientists label a piece 'inaccurate' they are often saying it is incomplete and lacks details (Dunwoody 1982, Friedman

1986, Nelkin 1995).

Dunwoody added that for accuracy in science news reporting you need the *technical accuracy* - where source and journalist can agree it is correct, and *communicative accuracy* - does the *audience* get an accurate picture? In order to improve technical accuracy the journalist should get more background information, meet the scientists face to face, and allow the expert to check the facts. To improve communicative accuracy you have to know your audience, tailor the information to the audience (and not the source), tell stories, use analogies, metaphor and graphics and dump a lot of the detail, highlighting the main points to allow individuals to visualise or 'see' what you are talking about.

At the same workshop attended by Dunwoody, Nan Broadbent, Director of the News and Information Office, American Association for the Advancement of Science, Washington, DC, said that even in the USA there is hardly any training for scientists to learn how to deal with the media.

Many of the comments made by the MRC scientists reflected unrealistic expectations of the media, which can only be addressed by training them in what the media are all about and what the media expect. *[Such a training programme commenced at the MRC in 2001 and seems to be making significant strides in establishing a more realistic mind-set about the media. Only 20 scientists may be accommodated at a time on these intensive courses - so the programme of training needs to be maintained and extended to reach as many scientists as possible in as short a time frame as possible.]*

Notwithstanding the fact that most scientists (65.4%) were satisfied with their coverage, most (41.3%) rated the journalist that covered them as 'not very knowledgeable' in terms of general knowledge; while 28.3% deemed them 'somewhat knowledgeable' (Q31). One scientist qualified their vote of "not very knowledgeable" with the comment "But very sharp!".

Remember the quote by Alton L. Blakeslee of Associated Press, New York, quoted in the Literature Review?

“Our communications have faltered when either side assumed that the other should of course know things which it had taken him part of a lifetime and long training to learn.”

(Krieghbaum 1957: 49)

Experiences of/feelings towards the media

The scientists were encouraged to make any other comments they wanted to regarding their experiences of or feelings towards the media (Q32). I list them all here, sorted into broad themes. They speak for themselves.

Do you have any other comments to make regarding your experiences of or feelings towards the media? Any comments will be very valuable:

Embracing the challenge:

“My *feelings* are that the media like to sensationalise. My *experience* - though extremely limited - indicates a professional and responsible reporting of the ‘truth’.”

“We need training in dealing with the media. It is not just ‘communication skills’ - it is more around understanding how the media work, how they will package a story, etc. Scientists generally tend to be dismissive of discourses they don’t understand.”

“At MRC we are fortunate to have access to trained communications staff. This greatly facilitates contacts with the media”

“The media usually uses competent people to cover certain areas in science, so we should not underestimate them!”

“Very positive relationship because i I understand their importance; ii treat them as equals; and iii always return ‘phone calls immediately. Too many scientists patronise the press, which equals a very quick disaster/antagonistic relationship.”

“I think the biggest problem was my own lack of preparedness for interaction with the media and lack of training in how best to work with them”

“On the whole, they do their best.”

Views on the media’s mission:

“If a story can run like a field fire, the media will publish it. But if it is a less controversial, less ‘flavoured’ topic, it’s not covered - despite good scientific value.”

“There is the danger of issues being sensationalised and/or misreported by nuance.”

“Media sometimes misinterpret facts. I have seen them having to apologise for this!”

- "Radio and TV journalists are looking for a sound bite; no depth can be obtained in understanding the problem"
- "Often just sensationalise reporting, no follow-up. No pressure placed on accountability for health disasters..."
- "More interested in sensation than scientific facts."
- "In general the media tends to decide for themselves what they think lay public wish to hear and are inclined to manipulate the information presented."
- "Media representatives are usually in a rush, expect us to stop all work and attend to them, or sometimes expect us to do their work (writing)."
- "Media hype is a bad thing and journalists need to be cautioned about this. Unbiased accurate reporting is needed and this is usually not the case!"
- "They tend to over simplify the facts - not always wise to do - cause for misinterpretation!"
- "I am not convinced that their agendas coincide often with those of scientists."
- "The urgency to write articles and produce programmes and news reports often results in superficial coverage of important issues."
- "The media usually looks for stories that will sell and therefore targets 'hot topics' like HIV in SA. This makes them sometimes blind for other good research in other fields."
- "A lot of time and input is needed to ensure accurate coverage in lay press"
- "Most media persons are very good but there are a few who are shocking - one learns who is who but when issuing a release one is at the mercy of the wolves!"
- "Usually it turns out OK, but occasionally the journalists 'get it wrong' or else the sub-editor writes an inappropriate by-line"
- "Media coverage is influenced by the experience and insight of the journalist. Inexperienced journalists tend to be anxious to get a 'story' and do not think about the implications of their report on the researcher/institution or public in general."
- "Its tough to be simple but exact! Moreover, personally I feel that basic research (as I do) is difficult to justify in terms of perspective/need, ethical/social implications"

Views on what is needed:

- "There is a need for scientific journalists with an in-depth understanding of medical research - the journalists are often very young with no scientific background"
- "We need to have health-friendly media journalists"
- "Journalists should make an effort or give the scientist the opportunity to double check their story before it goes to print so that it is portrayed as accurately as possible."
- "They do not have an adequate science background"
- "They need to be trained on how to report science correctly."
- "Generally positive but they have to be spoonfed. Very few journalists understand health issues/epidemiology - they need a crash course!"

"I am appalled to find leading national journalists who don't know what a percentage is."

"All important newspapers should have well-trained scientific reporters"

"The media need to know that while scientific knowledge is helpful, not all information is ground-breaking news."

"Media are a valuable resource to scientists. We, however, need more specialist scientific reporters who have some training in basic sciences - I seem to be giving genetics 101 and anthropology 101 to reporters before they catch onto concepts!"

"To expedite scientific stories it may be compulsory to insist that the journalists have training in some science degree/diploma"

"*Always* request that you are able to proofread the *exact* script before publication. Don't rely on telephone communication"

"Often there are misquotes because of lack of knowledge of the subject"

"International media are well versed - local/national not so much"

Fear and loathing:

"Irritability"

"Less interested in promoting science or even events that are scientific. When you deal with them you always have to be on guard."

"The press should not be allowed to report on oral interviews with scientists. The press should be given written reports, and any deviations from the report should be strongly viewed."

"They do their own thing and are unreasonably jealous of 'the freedom of the press'"

"I am wary of the media because of the frequency of misquoting"

"As a rule, media journalists make scientists feel inadequate and like strange human beings. They do not give scientists much respect. I think that is because scientists have low status in society - because of poor pay and standard of living"

"I generally feel apprehensive"

"Sceptical/reluctant/nervous. Afraid of being misquoted. I think media want to cause reaction in readers (like "wow!" or "oh no!") rather than informing them soberly"

"Poorly trained and looking for sensation"

"Anti-science bias is often evident. Journalists usually try to steer one in a (often wrong) direction, which tends to be aiming at negative sensation."

"I wish they would let me know what they are going to write/say first. I am *always* scared to read/watch if I have not seen/read the item beforehand and I cringe at the thought of what my scientist colleagues will say (or think)."

There isn't any formal training in science for journalists as such. Training generally has to be picked up as you go along. The only course on science and technology journalism in South

Africa is an optional part of a postgraduate course at the University of Stellenbosch. We are talking about a two-way street here. As much as the journalists could do with more background about the scientific process, the scientists also need to understand the media and how they work better. The ideal would be construction of a shared culture between source and journalist - but any movement towards better understanding each other will be valuable.

Unrealistic expectations and misunderstandings around the role and requirements of the media can be addressed by running training courses in dealing with the media for MRC scientists. The overwhelming majority (86.9%) had never had any such training (Q41). However, there was great interest in undergoing such training (Q42):

Had the scientists had any training in dealing with the media (Q41)?

Yes	13.1%
No, never	86.9%

Would they be interested in such training if the MRC provided it (Q42)?

Yes	80.8%
No	19.2%

Training in dealing with the media

As indicated above, 86.9% of the scientists had never had any training in dealing with the media, but 80.8% would be interested in such training if the MRC provided it (and, as one researcher put it: “Yes - provided the funding did not come out of my research budget”).

Those that were not interested in such training had reasons ranging from “No time” to “Not my job - should be MRC or someone else” (this researcher, working on inherited diseases, has published 30+ papers and has never had contact with the press). Another, also with 30+ papers, never mentioned in the lay media, never interviewed (working on women’s health - ‘regulatory hormones’) said: “My research is unlikely to be of interest to the media”. At the other end of the spectrum, media-confident Unit Director Dr Himla Soodyall said she didn’t need training because:

“I prepare my own, unique style of ‘unpacking’ information to media - I think I am passionate

about my work and can convey the outcomes enthusiastically for maximum effect!"

What type of training do the scientists think they need? What would they like training in (Q43)? Input here covered the gamut that a general course on dealing with the media would cover:

"General tips on how to communicate with the media - 'the rules'"

"An understanding of what could be published and why, also info. on deadlines, etc."

"Training in explanation of concepts"

"Guidelines on dress, language and posture. Actually, I know too little to suggest anything. Maybe this should tell you how critically change is needed."

"How to relate understandable, digestible news/sound 'bites'."

"Understand way media works; getting your message across; what to expect of the media; journalistic ethics"

"Presentation from top to bottom; tolerance - answering questions"

"To be able to not disclose some aspects of a study which is under way. Not to be pressurised by their style of questioning"

"Presenting scientific data in a simple, but effective way to the public"

"Getting to *know* the media, journalists"

"Communication and how to approach media sensibly"

"Handling a press release/conference/interview etc. Preparation, presentation, Q&A's etc."

"Responding to questions - what to say/not to say"

"How to convey brief, clear messages"

"How to handle tricky questions"

"Presentation, sentence construction, condensing data into sound bites, etc."

"Learning how to avoid becoming too technical"

"Focus areas of most interest to the media"

"Training to be assertive and confident about speaking about my research"

"Handling TV/radio interviews; handling spontaneous telephone interviews with journalists"

"Which information should not be disclosed? Protecting your own rights i.t.o. misinterpretations or the rights of your institution"

"How to manage the release of research findings into the public domain"

"Learning to be composed; learning to put important issues forward first"

Then there were those that wanted the impossible - if we could give training in these we could earn a fortune!

"How to elicit interest in important research and direct coverage to provide accurate media response"

"To get them to not misrepresent facts"

"Avoid excessive probing by the media"

"How to ensure they publish what you feel is important"

"How one can avoid questions/making statements that are misinterpreted by the media"

The positive response of 80.8% who want such training certainly gives the MRC a clear mandate to train its scientists in dealing with the various media, and to push ahead with the training courses begun in 2001.

Would the scientists agree to be on an MRC list of 'expert contacts' for the media (Q45A)?

Yes 67.0%

No 33.0%

What were the concerns of those that did not want to be on such a list (Q45B)? Lack of training and experience in dealing with the media was the main reason, given by a number of respondents, as well as lack of time ("Time, time, time, time, time" one wrote). Another:

"I am already contacted in some fields. I fear the demand would be unmanageable if I was on a list - my work is pressurised enough as it is."

Some just don't want to be involved in such interaction ("I don't like it personally"), or are nervous about it ("[I] Do not feel confident about speaking to media"). This lack of confidence is to be expected given the overwhelming lack of training in dealing with the media. Others would be keen if training and support were given:

"Would be yes if training received and given executive approval."

"Yes - but in some way I would like to be 'protected by' or 'backed' by MRC."

8 Communication by the MRC

Summary

The MRC had produced press releases or briefings on the work of 37% of the scientists in the previous year. A further 37% of the scientists had research that was ripe for such coverage, but most of these had not contacted anyone to discuss achieving this. Reasons given included lack of time, not thinking about it or not bothering because such work is not rewarded or valued. Regarding whether the MRC should formally reward researchers for disseminating their findings to the media and others, 45.9% said they should while 40.8% felt that they should not. Thirty-two respondents had spent time on 'public understanding of science work' in the past year, with a mean of 6.5 days spent and a maximum of 30. The scientists support the MRC providing numerous mechanisms for communicating with the public, including access to trained staff and training, and provided many useful ideas for interaction with the public and media. They also provided many illuminating additional comments that point to the need for various clear policies around communication by the MRC.

“The MRC must be increasingly aware of the importance of and its accountability to stakeholders. The taxpayer (individual and company) is the major shareholder via the science vote and has the right to demand high-quality, up-to-date health information and value for money. It is important that the MRC demonstrates the value to society of public-funded health science and continues to improve its relationship with stakeholders through mutual understanding, communication and education.”

(MRC Strategic Plan 1999-2002: Vision and strategy)

Thirty-seven per cent of respondents indicated that the MRC had produced press releases or briefings in connection with their research in the last year, the same percentage having personally contributed to such press releases or briefings (Q34 and Q35). A further 37% said that they had research findings or developments that would be suitable for an MRC press release/briefing, but that had not been covered yet (Q36). Of the 37%, 85% indicated that they had not yet contacted the MRC's Corporate Communication Division (this division sends out

press releases, handles media liaison, etc.) to discuss dissemination of their findings (Q37).

Prompted as to why not (Q38), lack of time, 'just not thinking about it' and a general sense of 'why bother' were recurring reasons given in comments:

"The MRC has a system of rewarding scientific journal publications. Anything else, MRC views as 'less valued'. Why should I then bother to use time and energy for a press release that's not valued on my track record by MRC?"

"Time"

"Too busy"

"Little time, and a feeling that I would have to do all the work"

"Didn't think about it. At MRC we are not evaluated according to number of press releases"

"Assume they would evaluate published papers"

The comment about what is seen as being 'rewarded' and what is valued on the track record is a recurring one, and also arose in all the other surveys of scientists and the media that were examined in the Literature Review. It links in with comments around Q46: 'Do you think that the MRC should formally reward researchers for disseminating their findings to and interacting with the media and other non-scientists?'. This question revealed that feelings around this issue are as intense in South Africa as they are in Australia (Gascoigne & Metcalfe 1997) and the UK (Wellcome Trust 2000; Winstanley 1996).

Responses to the question were as follows:

Yes	45.9%
No	40.8%
Don't know	13.3%

Researchers that felt that such interaction should be rewarded commented:

"Surely so. The current 'culture' of peer-reviewed journals is maybe a too narrow-minded one. I can probably reach 20 000 readers if I publish in *Bona* or *Femina* or *Fair Lady*, and can contribute through this to the health of the nation much better than through journals, read by 200 scientists."

"If the MRC made a dedicated budget available, that did *not* take away resources from operational costs, that would work... without additional funding it would be hopeless."

"They should reward work that results in improvement of people's lives, by whatever method. If that method is persuading the public, good. If that is persuading the government, good."

"It would encourage more people to disseminate their information/findings"

"Reward individuals or units that disseminate the results of their work!"

"The MRC needs to create an incentive for this time-consuming work which is often greeted with ridicule by one's colleagues."

"Its part of our job but it should be taken into account in performance appraisal."

"These efforts/inputs are not valued or considered for performance appraisals although it is as time consuming and of good quality"

"This would contribute to demystifying science"

"After all, findings have no value unless communicated. Also, the continued support and encouragement by MRC gives incentive to scientists to accomplish more."

"I don't mean 'reward' by money per interaction. However, interaction with media etc should be one of the measurable outputs alongside articles published, students graduated etc."

Others are concerned that rewarding this interaction will take away from the traditional means of assessing scientific research - the peer-reviewed journal article:

"Media interaction is a time-consuming activity which draws scientist away from the reason why they are employed in the first place."

"Not all scientists have an interest in being seen and heard; this does however not make them scientists of a lesser quality; they should not be penalised for certain characteristics."

"Although communicating with media is important, there is no standard measure of the impact of different media, and many scientists with 'connections' have unfair advantage."

"Sometimes a little encouragement is needed, but rewards can get out of hand."

"While it is important to report one's research activities, I don't think it is appropriate to report all research for the purpose of reward."

"First priority, scientific publication in peer-reviewed journals! No need to reward!"

"No, definitely not. If we reward speaking to the press then there is less incentive to publish in journals and scientists may go to press more often than publishing - this is totally unacceptable."

"Too tempting to release rubbishy research, not yet peer-reviewed"

"Not all research is equally suited for public communication"

"Publication in peer-reviewed journals should always be most important. Small rewards for interacting with media only"

"Researchers don't get rewarded for disseminating their findings to the science community - what's the difference?"

"This should be a normal part of employment expectations of the MRC and should be supported in this spirit by MRC staff"

Certainly the MRC should formulate a policy for its scientists around the dissemination of results/interaction with the media that recognises and encourages such endeavours in some way.

During the past year the following percentages of respondents had participated in media-related events to do with MRC-supported work (Q39):

Press conferences	6.0%
News releases	9.0%
Interviews	21.0%
Interacting with media attending scientific meetings/conferences	27.0%
Other (<i>'Other' included Science Expo's, a travelling roadshow and workshop at SciFest in Grahamstown</i>)	7.0%

In addition to this, 35.3% had spent time on 'public understanding of science work', e.g. popular lectures, exhibitions, interviews, etc. Thirty-two respondents indicated how many days they had spent on this in the past year, with a mean of 6.5 days and a maximum of 30 days. The 3 scientists with the highest number of days spent on these activities had spent 20, 28 and 30 days on public understanding of science work in the past year (Q40A & 40B).

What mechanisms for communicating with the non-specialist public do the respondents think the MRC should provide (Q44)? There were relatively high rates of responses here:

Access to staff with expertise in dealing with the public	51.0%
Access to staff with expertise in dealing with the media	63.0%
Training for conference speaking	40.0%
Guidelines on communicating with the public	59.0%
Participation in science festivals/schools collaboration	33.0%
Training courses for communication with the media	63.0%
Training courses for communication with the public	45.0%
Exhibitions of current research at museums/at the MRC	27.0%
Other	4.0%

Comments and suggestions under 'Other':

"Do's and don'ts re visual aids, e.g. transparencies, slides, slideshows, etc."

"Promoting public participation in scientific debates (e.g. GMOs)"

“Training in advocacy - using research to influence policy”

“Appoint a good science-trained journalist to translate scientific writing into journalese for the media”

“Continually changing website - cf. Wellcome Trust - with spin-off press releases to print media and TV/radio ‘project of the week’.”

“Exhibitions elsewhere, e.g. museum/Waterfront”

And finally, again the request for recognition from the MRC for ‘public understanding of science’ activities:

“The MRC must recognise the scientists who spend time doing extra PUSSET activities if the MRC is going to be involved and wants its scientists to be.”

Ideas for interaction

The scientists provided very useful ideas and comments on how they thought the MRC could further or better interact with the media about its research findings (Q47):

Specialised communication:

“Certainly a specialist communication unit within the MRC is best to act as a mediator between scientist and public. If a researcher has ‘star quality’ use and exploit it, but don’t formally reward it.”

“Get a PRO? Let MRC media people come to my office and ask me what findings do I have?”

“Staff need to be trained on how to do it first.”

“Link with other research agencies - e.g. Health Systems Trust, WRC, ARC; provide cohesive research inventory; link with Health-e - electronic health news agency”

“Scientists must regularly report scientific results to communication division in a structured way - more interaction”

“Meet and discuss topical issues with researchers. The MRC Communications dept is very distant from research activity in the individual departments, especially where young researchers are concerned.”

“Appoint a specialist to deal with this issue alone - full time”

“Media liaison person needs to know the breaking research publications, and needs good, personal media contacts”

“Need to put ‘briefs’ on the ‘line’. MRC communication need to find out what scientists are doing, not other way round”

"Corporate communications should familiarise themselves with all their researchers - not just the more noticeable, outgoing, flamboyant, on Medicina campus ones, etc. Then they will have more to offer the media for interactions."

Media activities:

"To have 'high profile' individuals liaise with media about interesting work after they have been published in peer-reviewed journals. Engage in a TV programme about medical and related issues on a weekly basis"

"Regular news updates in popular press - continued awareness."

"Have regular contact sessions."

"The media should be invited to the labs so they can understand what goes on. A good reporter needs to first get a thorough understanding of the research and the environment in order to report effectively. Its similar to a career in 'acting'. One needs to assume a role with passion for there to be a convincing character."

"Collaborating with TV, scientific series; attractive presentation with mainly pictures/visual; fewer slogans"

"Regular briefing sessions with media"

"Quarterly national newspaper reports"

"Regular, frequent communication on important published work. Most of the good work ends up in scientific journals, unknown to the general public"

"Use the Sunday Press, and use flyers, 'hot off the press' short bulletins for rapid dissemination"

"A monthly/quarterly 'MRC column' in the popular science press, and for local/national press (in multiple languages)"

"Weekly press release"

"Have a regular short TV programme on popular aspects of relevant science and persuade a TV station to broadcast it"

"An MRC media day could be arranged once or twice a year"

"A media panel could be established for regular interaction with the media (one member of each research unit could feed the panel with information on a 6-monthly or quarterly basis)"

"Encourage radio/TV stations to produce programmes reporting on topical issues. The MRC should be directly involved on an ongoing basis."

"Regular meetings with journalists/media; regular release of 'news' in bulletins"

"Target high-profile programme such as *Carte Blanche* with topical issues that will be well received by all (potentially free advertising too)."

MRC-wide suggestions:

"Scientists should be encouraged to contact MRC for assessment of importance of results.

Problem = time!"

"MRC should promote contact on results not on proposals - I have found the constant media hype on SAAVI to be inappropriate. Proposals are confidential and therefore should be protected."

"To continue to be seen at major congresses and make comment as at the HIV congress"

"MRC does very well!"

"Encourage MRC-funded researchers to communicate with media and assist them to do so"

"MRC should visit units frequently to pick up angles, stories, etc. We are often too immersed in our work to realise something is newsworthy."

"Just make it a priority"

"Yes, by not always punting its own Units and employees, especially confining publicity to the Western Cape institutions/researchers"

"We need to train staff about the advantages of being responsive to the media and how best to work with the media. Need to tailor initiatives to MRC scientists at different levels (e.g. those with differing levels of experience with media)"

"More discussion within the organisation on the issue"

"Guide them - the reward is getting the message through"

"Open days - the public and other researchers can see where and how things are done at the MRC; interactive electronic media - like the Internet"

In terms of improving communications between the general public and scientists (Q48), the following three options were top ranked:

Appointment of specialist communicators at the MRC to talk to journalists	50.0%
MRC to encourage time spent on science communication	48.0%
Appointment of specialist communicators at the MRC to talk to the public	36.0%

Only 25% thought that 'Stipulation in research grants or contracts to communicate with non-specialist public' would lead improved communication.

Comments written in next to 'Other' for Q48 included:

"Scientific information in the language/s of the public"

"Producing technical reports for this purpose is costly and funding must be available from funders or MRC."

"MRC should co-ordinate interaction between scientists and the press. Give us the forum and we will do the job!!"

“A regular forum for scientists to meet press journalists, to help bridge the gap between scientists and journalists”

Next to ‘stipulation in research grants ...’: “Definitely not! Not all scientists have time, interest or ability to communicate with public - requirement to do so would drive them away”

“I would enjoy having time to visit schools, colleges, universities, to meet young people and teachers to expose them to the wonders of science”

“MRC to act as broker and referral centre”

“This must be a scientist-driven exercise - many will not want to be involved and should not feel *forced* to do so - but could be *encouraged*.”

Additional general notes or comments from the scientists

The scientists were very forthcoming with general comments around this subject in a section for ‘Additional comments’ at the end of the questionnaire. The interest and interaction is much appreciated, and the remarks are reported in full here, organised into general themes. They provide some clear, focused feedback in terms of certain issues the MRC needs to address in order to facilitate encouragement of communication by its scientists.

First off, lengthy and illuminating comments from one researcher at the forefront of public communication activity:

“Many MRC/university-based scientists are unaware that they should *offer* info. to corporate communications for dissemination. They believe that their research or fame will be recognised - not usually true.

“Many scientists are reluctant to publicise their work because it is often misquoted or misrepresented or sensationalised in the press. Then they are laughed at/sneered at by their colleagues. It is not every scientist’s ‘cup of tea’ to be involved in publicising/dramatising their science.

“It can be hard to strike a balance between doing research/running a research team and being involved in public awareness activities.

“South African press (and scientists) overlook the home-grown variety and just love the overseas variety.

“The MRC have messed up *real* chances to publicise its own research, and fields of science, to the general public. I am referring to some of the Roadshow, Grahamstown Science festival, V&A Waterfront hurriedly thrown together initiatives.

“Many scientists (and their bosses) are very happy to have a once-off feature article in the

popular press/national news - this doesn't take much of their time and brings them personal glory and recognition. BUT they are reluctant to be involved in long-term public awareness workshops, expos, road shows, etc. This takes time and doesn't bring fame (or fortune).

"Specifically concerning Question 11 (*personal disadvantages in communicating research*).

This year I was asked by my boss to very carefully consider if the head of the MRC wanted his scientists to spend time on public awareness of science activities. His opinion was that the MRC wanted articles in *Nature* much more, and that the message was I would be seriously disadvantaging myself by spending time on the Puset activities - the writing was on the wall. I suggested that the MRC probably wanted both - but was again warned to think very carefully if I should continue any commitment to Puset. My further response was that I could not try and guess what the MRC policy was, if I was to stop being involved, some authority must convey that clearly to me.

"I never have received direct instructions since regarding this issue, from my boss or a higher authority. However, I have continued on my own course, regardless (which is one of the nice things about being a scientist, there is a lot of personal freedom)."

The above clearly indicates the need for the MRC to formalise and communicate policies around time and efforts to be spent by researchers on communicating their research to the public and others, to its own researchers.

A policy must also be agreed and communicated to the scientists about rewarding or recognising such efforts:

"As long as there is no reward - either financial or in terms of promotion or salary increments - attached to carrying science and its findings to the public/media, scientists will refrain from it. MRC must first make scientists feel and experience the acknowledgement and appreciation for talking to the public and media."

The MRC also needs a clearly spelt out media strategy:

"A major issue is the lack of MRC rules for speaking to the media, e.g. may a junior scientist comment to the media on an MRC project? May an MRC employee comment on a political issue, e.g. Mbeki AIDS panel? May an MRC employee attack the government, e.g. for not providing AZT to pregnant women? The MRC urgently needs rules for dealing with the media."

"All scientists need to understand how the media works, so that unguarded/unintended comments are not published; we need clear guidelines from MRC. Scientist and science managers need to accept that media liaison is a valid part of the work of a scientist - and

ensure that it is recognised as such - MRC policy is not clear on this matter.”

“There are many scientists who have vested interests in their own technologies and who don't see the ethical contradictions in their attempts to promote such technologies to the public - I would like a media strategy that is critical. Science as value-free is an incorrect assumption ('facts') to inform media interactions.”

The MRC media strategy/policies also need to be clear on the Ingelfinger rule:

“I think this is an important area and I feel privileged as its one I find easy to work in and do a lot of. I am aware that its not the same for most of my colleagues and I am sure the MRC could help them communicate better. Part of the challenge is to get them to realise its their responsibility. I noticed in the revised ethics guidelines that the 'Ingelfinger' principle is still cited as the guide. This is the one stating that researchers shouldn't publish in the popular press before findings appear in peer-reviewed journals. I think this inhibits the public understanding of science and use of findings for advocacy. If we followed it (and we don't) we would have a 2+ year lag between results actually being available and being able to use them for policy. This is not appropriate for public health research. There are other ways of ensuring quality scientific inputs than waiting for the terribly slow process of peer-review article processing by journals.”

Communication is seen as being able to promote a more realistic image of scientists:

“This area of communication between science, scientists and the public provides wide scope for promoting public support of scientists, scientific bodies and research. In general, the world over, scientists are viewed as shady characters who are often mixed up with 'bad things'. I feel that science and scientists and the MRC are often viewed with suspicion and distrust by the media and the general public and this creates fertile ground for the antiscience lobby and its main weapon - misinformation.”

“The media is sensation seeking sometimes misrepresenting the issue so as to get people talking/debating about this issue sometimes to the disadvantage of the scientist that did the work.”

“I think we scientists get such a bad press or have such difficulty in getting our ideas read or heard or believed, is that in SA we have low social status - we are considered to be similar to school teachers and therefore our views and opinions are not sought after, or if given, are not believed.”

“An important point I think is that the public mistrust 'biological scientists' more than any other

type (mathematicians, chemists, engineers, computer scientists etc.). Most 'mad scientists' in stories/TV/movies are engineering humans/animals/plants/bacteria with the intent of undermining society. Therefore, specialist communication by people with time to do so, needs to focus on the matter."

"I firmly believe that there should be closer co-operation between journalists and scientists, e.g. for screening for correctness of reports. I also feel very little of the science that is practised in SA ever reaches the layman (via press/TV), and the general public has therefore no pride or knowledge of the many excellent scientists that we have in the country."

The need to improve communication with the public is recognised, as are related problems:

"I think there is a real and great need to disseminate research findings to the general public. The MRC has for too long paid a lot of attention to academics (almost exclusively) and has ignored the importance of those they are supposed to benefit - i.e. the people at grass-roots level! At this level, the MRC and its research is hardly known!"

"Greater coverage of our research in the non-specialist media also addresses the need expressed by the MRC to become a household name, much in the way that the NIH is."

"Although this is important for personal health it may be more important for the policy makers to be informed, thereby reducing the overall burden of disease in the country."

"What public are you trying to reach? Educated or uneducated both need different approach. AIDS education is the prime example. Educated masses in Europe/USA have reversed the trends while the uneducated masses of Africa and India have no understanding."

"How does one communicate effectively from a factual baseline when often misinformation or the person presenting from a limited understanding is more attractive/appealing to the general public?"

"Personally I believe that a broad public can only be reached by TV (and newspapers). TV is powerful and very influential; however often misused by biased journalists, biased towards sensational news!"

"While national campaigns are held on certain calendar days to honour specific disease-related topics - the MRC contributes very little to this. More effort should be made towards active involvement in honouring these days."

“Communication in this Millennium should be by electronic means ... the MRC should communicate via website to the public, schools and tertiary institutions.”

“I think public communication of science, and public understanding of science are not necessarily connected. Enormous barriers stand in the way - poor basic schooling, survival priorities, media orientation to entertainment rather than education. So, if we invest in this goal (communication of science) we should plan and evaluate alternative strategies (scientific approach to science communication!).”

Then there are the fears associated with the process:

“The most important fear that scientists have when talking to the media is misrepresentation (e.g. distortion, sensationalism, mistaken, biased reporting, muddled facts) of scientific findings.”

“The hullabaloo around GMOs is a classic case for reflection. I am on the government advisory committee and know a bit about it. Even respected scientists have been conned into believing trash propagated by the media.”

One scientist thinks the MRC should focus funding on its research, not communication of it:

“Communication of science implicates (1) learning the skills of communication (2) understanding and listening to the public (3) repeated exposure to create the awareness. MRC does already an excellent job. Funding needs to be increased for research, not for communicating (often preliminary) results.”

9 Conclusion: Commitment to a culture of dialogue

“As long as there is no reward - either financial or in terms of promotion or salary increments - attached to carrying science and its findings to the public/media, scientists will refrain from it. MRC must first make scientists feel and experience the acknowledgement and appreciation for talking to the public and media.” -

Comment by an MRC scientist in the survey

The findings of this first assessment of the attitudes of MRC scientists to the media and to reporting their findings to the public indicate that in order to increase communication between MRC scientists and the public, a number of actions need to be taken. These will promote and accelerate alignment of the MRC’s organisational culture with its strategic intent of communicating with its stakeholders - its number one stakeholder being the general public.

Communicating the MRC’s commitment

First off, for the MRC to truly become a communicating organisation it must clarify and commit to efforts at public dialogue. This commitment needs to be formally communicated to and to permeate all levels of the organisation and down to individual scientists. The MRC President has indicated his commitment to ‘the need for science to be understood by the public and for scientists to communicate better’. The MRC’s expectations of individual scientists in terms of this must be clearly outlined and communicated to them. Communication activities by the scientists should be duly assessed as a recognised part of their performance evaluation. If the MRC places value on this function, communication activities by its scientists must also be *valued and recognised*.

For the scientists to be able to carry out communication activities around their research, *encouragement and support* must be provided by the MRC. *Time* will have to be allocated for

communication, *training* will have to be provided, and *incentives* outlined. Allocation of time to communication would imply that this activity should be 'written in' as part of the scientists' jobs. Science communication and the development of links with the community and the media should be seen as part and parcel of scientific research, and given due recognition.

It is clear from some scientists' comments that without MRC support of their efforts to communicate and adequate recognition of such efforts, they won't bother to commit time or energy to them:

"The MRC has a system of rewarding scientific journal publications. Anything else, MRC views as 'less valued'. Why should I then bother to use time and energy for a press release that's not valued on my track record by MRC?"

"The MRC must recognise the scientists who spend time doing extra Puset activities if the MRC is going to be involved and wants its scientists to be"

The MRC had produced press releases or briefings on the work of 37% of the scientists in the previous year. A further 37% of the scientists had research that was ripe for such coverage, but they had not bothered to contact anyone about it. Reasons included lack of time, not thinking about it or not bothering because such work is not rewarded or valued.

Lack of time will remain a significant barrier as long as scientists feel they would be better off spending time from their crowded schedules on preparing formal publications and that their employer does not value efforts in media work. The Australian survey (Gascoigne & Metcalfe 1997) also stated that a cultural change is required before scientists will make more use of the media:

"It has to become an accepted, rewarded, recognised and legitimate activity, encouraged at the highest levels and actively promulgated through research organizations."

Comments about what is seen as being 'rewarded' and what is valued on the track record recurred in the MRC scientists' comments, and also arose in all the other surveys of scientists and the media that were examined. Such comments also linked with those around Q46: 'Do you think that the MRC should formally reward researchers for disseminating their findings to and interacting with the media and other non-scientists?', with 45.9% saying the MRC should

while 40.8% felt that the MRC should not. One of the comments in favour of rewarding them:

“Surely so. The current ‘culture’ of peer-reviewed journals is maybe a too narrow-minded one. I can probably reach 20 000 readers if I publish in *Bona* or *Femina* or *Fair Lady*, and *can* contribute through this to the health of the nation much better than through journals, read by 200 scientists.”

To reiterate Joubert’s (2001) statement about the South African science councils:

“Science councils are willing and committed at grassroots level, but often without the resources or the backing of their leaders. The councils must take responsibility for science communication, which should perhaps be included in their Acts (as is the case in the United Kingdom).”

It is time for the MRC to put some of its money where its mouth is.

Clear policies

The scientists support the MRC providing numerous mechanisms for communicating with the public, including access to trained staff and training. Many of their comments highlight the need for various clear policies around communication by the MRC.

- Certainly the MRC should formalise and communicate to its own researchers its policies around time and efforts to be spent by its scientists on communicating their research to the public and others and interaction with the media.

This would avoid situations like this scientist faced, being told by her boss that:

“... I would be seriously disadvantaging myself by spending time on the Puset activities ... was again warned to think very carefully if I should continue any commitment to Puset. My further response was that I could not try and guess what the MRC policy was, if I was to stop being involved, some authority must convey that clearly to me. I never have received direct instructions since regarding this issue, from my boss or a higher authority.”

- Policies must also be agreed and communicated with the scientists about rewarding, recognising and encouraging such efforts.
- The MRC also needs a *clearly spelt out* media strategy that gives guidelines on specific situations:

“A major issue is the lack of MRC rules for speaking to the media, e.g. may a junior scientist comment to the media on an MRC project? May an MRC employee comment on a political issue, e.g. Mbeki AIDS panel? May an MRC employee attack the government, e.g. for not providing AZT to pregnant women? The MRC urgently needs rules for dealing with the media.”

- The MRC media strategy/policies also need to be clear on their stand in terms of the Ingelfinger rule:
“... This is the one stating that researchers shouldn't publish in the popular press before findings appear in peer-reviewed journals. I think this inhibits the public understanding of science and use of findings for advocacy. If we followed it (and we don't) we would have a 2+ year lag between results actually being available and being able to use them for policy. This is not appropriate for public health research. There are other ways of ensuring quality scientific inputs than waiting for the terribly slow process of peer-review article processing by journals.”
- They would also have to be clear on commercial agreements which preclude public disclosure: “What are appropriate policies for the government-funded research organisations? How can the public scrutinise research which is still substantially funded from the public purse, but which is shrouded in secrecy at the insistence of commercial partners?” (Gascoigne & Metcalfe 1997).

A look at the landscape

It was heartening to find such a positive attitude among the scientists towards communicating with the public, who they view as one of the most important groups that they should communicate their research to (‘the public’ and ‘policy makers’ being neck and neck):

- fully 92.8% of the scientists strongly agreed or tended to agree that they have a duty to communicate their research and its implications to the public;
- 70.8% strongly agree or tended to agree that they would like to spend more time doing so; and
- 55% feel fairly well equipped and 22% very well equipped to personally communicate the scientific facts of their research to non-specialists.
- The scientists recognise that the non-specialist public are most likely to glean their knowledge of scientific research and its implications from the lay media (Q7), and

most of the scientists believe that talking to the national (71%) or local (61%) press or TV and radio journalists (60%) or speaking on TV/radio (59%) are effective methods of communicating their own research and its implications to the public.

- 80.8% of the scientists would be interested in receiving training in dealing with the media if the MRC provided it.
- When their work (or themselves) had been the source or subject of a news story, most (65.4%) indicated that they had been either 'very satisfied' or 'somewhat satisfied' with the coverage.

It is clear that the scientists generally want to communicate and see the potential benefits of it. However, there are also a number of barriers in the way of communication efforts, which are definitely hampering the process. These barriers include lack of time, little trust in the media, little training in dealing with the media, and lack of support, encouragement and incentives:

- Barriers to greater understanding of science among the non-specialist public were seen as 'Little public understanding of what scientists do' as well as 'Lack of education' and 'Lack of communication skills among scientists'.
- Personal disadvantages of communicating their research to the public are seen as the possibility that 'My research could be reported inaccurately' and a feeling that it 'Takes too much time'.
- The scientists tend to agree that the day-to-day requirements of their jobs leave them with too little time to communicate the implications of their research to others (47.5%) or even to get on with research (36.4%).
- While the scientists recognise that the non-specialist public are likely to glean their knowledge of scientific research from the lay media, the scientists themselves do not trust these media to provide accurate information about science (e.g. only 5% trusted national newspapers to do so).
- The scientists also did not rate general coverage of science and technology in the media very highly, and most also rated the journalist that covered them as 'not very knowledgeable' in terms of general knowledge.
- Many of the comments made about coverage of their work and about the media in general reflected unrealistic expectations, which can only be addressed by training the scientists in what the media are all about and what the media expect. The overwhelming

majority (86.9%) of the scientists had never had any training in dealing with the media.

Promoting engagement

Support and encouragement from the MRC are necessary to improve the quantity and quality of its scientists' communication with the public. The mistrust of the media by scientists described by Palevitz & Lewis (1998), Hartz & Chappell (1997) and others as almost defining an 'international corporate culture' of scientists was evidenced by this survey. It therefore seems that an attitudinal change among some of the scientists themselves may also be important.

Unrealistic expectations and misunderstandings around the role and requirements of the media can be addressed by running training courses in dealing with the media for MRC scientists. The positive response of 80.8% who want such training certainly gives the MRC a clear mandate to train its scientists in dealing with the various media, and to push ahead with the training courses begun in 2001. These intensive courses seem to be making significant strides in establishing a more realistic mind-set about the media. Only 20 scientists may be accommodated at a time, however - so the programme of training needs to be maintained and extended to reach as many scientists as possible in as short a time frame as possible.

Workshops to advise the media on how to report accurately on scientific issues are also envisaged (some having been held in July 2001 specifically around the issue of reporting on HIV/AIDS). The challenge of the training for scientists and media is two-fold: to change the behaviour of the media, and to change the behaviour of scientists in dealing with the media. It is vital that a more comfortable relationship be developed between the groups - or at least between certain key members of each group.

The Wellcome Trust/MORI survey (2000) found that participation in communication activity was related to the scientists' level of skill and confidence. As the MRC's scientists are trained in dealing with the media and become more comfortable doing so, it is hoped that

communication activities will increase - especially if such activity is specified by the MRC as being expected, being valued and rewarded, and worth spending valuable time on.

Concerns that research data will be misinterpreted by the media are best addressed by providing members of the media with easily understood explanations; withholding the information may promote even greater misunderstanding. Informal meetings and lunches between MRC scientists and the media are ideal opportunities to get to know each other as well as to work out areas of co-operation. The first MRC scientists/media lunch held in 1999 earned the MRC excellent coverage from leads that emerged over the dinner table (reporter Claire Bisseker of the *Financial Mail* later won the Science Councils' Science Journalism Award for her story on the MRC that arose from that occasion) and should be actively promoted and continued on a systematic basis.

As Krieghbaum (1957: 100) says:

“While some top-flight science reporters do go out foraging in labs and on campuses for news, most spend their time attending science and technical conventions, reading journals and scanning press releases. More than in most other fields, such as politics, say, the news comes to the science writers.”

The MRC has to ensure that the great divide is crossed, and get its scientists to get their news out there *to* the journalists.

Although a culture of communication with non-specialists is not yet widespread, and although the scientists themselves don't trust the media, the scientists feel that the public *do* trust the media to provide accurate scientific information. Getting more information about the MRC and its work into the lay media is definitely one way of getting this information to the general public of South Africa, who pay for it.

Journalists and scientists both have a responsibility to educate and inform the public in order to avoid misinterpretations and misapplications of science. The scientists are the gatekeepers to the research findings. Only through them can this trove of information be unlocked and revealed.

Many today lay great emphasis on proactive engagement and dialogue. Lowe (2000) feels that researchers should go straight to direct dialogue with the public:

“Researchers need to be telling the public directly about the significance of what they are doing, rather than hoping some newspaper will pick up something positive from a press release. Some scientists now have their own website, while others have regular radio slots to explain issues directly to the public. We need more scientists to follow in their footsteps - but they need help to do it. All our science degree courses should include communication training.”

It has been suggested (Solomon 2000) that the MRC research grants system should build in aspects of public and policy-maker engagements as an integral part of the research process. Every project should be able to adequately indicate how the research has and/or will be utilised in the formulation of policy for public health systems - or how the products of research will benefit society in a sustainable, cost-effective way, and be communicated effectively.

Only 25% of the respondents thought that ‘Stipulation in research grants or contracts to communicate with non-specialist public’ would lead improved communication though. But this may be a symptom of the lack of training and experience and hence lack of confidence in dealing with the media/public.

The UK’s Biotechnology and Biological Sciences Research Council (BBSRC), for example, requires each new grant recipient to provide a lay summary of their research aims, to outline how they will promote public understanding and to describe this in their final report. The expectation is that researchers spend at least 1 to 2 days per year on public understanding. Activities in support of public understanding are part of the annual performance review of scientists in BBSRC-sponsored research institutes. Anecdotal evidence (Winstanley 1996) suggests BBSRC researchers are becoming much more positive about interacting with the public. Most now enjoy it, including those who were reluctant or sceptical at first.

In terms of improving communications between the general public and scientists (Q48), the following three options were top ranked by the MRC scientists:

Appointment of specialist communicators at the MRC to talk to journalists	50.0%
MRC to encourage time spent on science communication	48.0%
Appointment of specialist communicators at the MRC to talk to the public	36.0%

It has been pointed out how few 'science communicators' there are in South Africa. And wanting these 'science communicators' to take over doing what the scientists themselves believe they have a duty and responsibility to do, is yet another symptom of the lack of experience and confidence in dealing with the media and public among the scientists.

Many activities around research advocacy are planned for the MRC:

- *Stakeholder awareness* (value of health research in socio-economic development), including monthly media briefing/interaction; training journalists, radio/television producers and editors on health research outputs reporting (and the importance of adequate reporting to ensure positive developmental impact); assisting programme development for community radio stations; updating MRC in-house media interaction skills (MRC Board, management and scientists).
- *Socio/political advocacy*, including quarterly face-to-face briefings to Parliamentarians through the Health Portfolio Committee; developing a module for input into the parliamentarian annual training programme; database collation for the implementation of regular electronic updates directly to Members of Parliament; and briefings to relevant NGOs every 6 months, as well as database collation to facilitate electronic and hard copy (e.g. newsletters like *MRC News* and *AIDS Bulletin*) updates every 2 months.
- *Industry/developmental outreach*: creating partnerships and monthly briefings with with the health and pharmaceutical industry; submitting editorial/advertorials to industry-specific newspapers and offering training to writers and editors.

A critical first step in these ambitious plans is to get all MRC scientists on board, spelling out to them the importance and value that the MRC places on their communication activities, and supporting such activities in terms of time and resources.

In closing, some words from The Wellcome Trust/MORI survey (2000: 49):

"The development of a legitimate culture of dialogue will be a long-term process, yet the rewards could be considerable. The next generation of scientists ought to be able as well as willing communicators, which will benefit not only the public, but also scientists themselves, and science and scientific research as a whole."

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Appendix I MRC scientists and the media - questionnaire

What is the principal source of funding for your research?

- Wholly or principally funded by the MRC
- Wholly or principally funded by government
- Wholly or principally funded by a higher education institution
- Wholly or principally funded by a pharmaceutical company
- Other principal source of funding - please indicate:.....

16

Number of articles published in peer-reviewed journals?

- 1-10
- 11-30
- more than 30

Number of authored journal articles mentioned in the lay media?

- 0
- 1-2
- 3-5
- more than 5

18

Thank you. Remember, all your responses will be kept strictly confidential if you wish. Names will only be used if express permission is given at the end of this questionnaire.

Q1. What is your main research area or areas? Please state briefly, e.g. cardiovascular medicine, health systems research.

.....

20

Q2. What does the term 'Public Understanding of Science' mean to you, personally?

.....

.....

.....

Q3. If you had to communicate your research and its social and ethical implications, who do you think would be the most important group to communicate with?

.....

22

Q4. Why do you say that?

.....

.....

Q5. How knowledgeable do you think they are about the *science* in your research area?

- Very knowledgeable
- Fairly knowledgeable
- Not very knowledgeable
- Not at all knowledgeable

23

Q6. What level of awareness do you think they have about the *social and ethical implications* of your research area?

- Very good awareness
- Fairly good awareness
- Not very good awareness
- No awareness at all
- My research has no social or ethical implications

24

Q7. Below is a list of sources of information. Which, if any, would you say the non-specialist public uses to obtain information about scientific research and its social and ethical implications? (By non-specialist public I mean people with no specialist knowledge of or training in science.) Please tick where applicable.

- General interest magazines, e.g. women's or men's magazines
- Information published by bodies/groups such as MRC, CANSA etc
- Local newspapers (e.g. *The Cape Argus*)
- National newspapers (e.g. *The Sunday Times*)
- International or foreign newspapers
- Radio documentaries and current affairs programmes
- Radio dramas
- Radio news
- Scientific journals
- The 'popular' science press (e.g. *New Scientist*)
- The internet/web sites
- TV documentaries and current affairs programmes (e.g. Discovery Channel)
- TV dramas and films
- TV news
- Other (please write in)

25

 30

 39

Q8. What, if any, would you say are the main BARRIERS to greater understanding of science in general among the non-specialist public? Please tick where applicable.

- A lack of appreciation (among the non-specialist public) of how science affects them
- Biased media coverage
- Commercial or other barriers to publishing information
- Insufficient media coverage
- Lack of communication skills among scientists
- Lack of knowledge about the facts of science/Lack of information
- Lack of public interest/apathy/indifference
- Lack of funding
- Government policy
- Lack of education
- Lack of awareness among scientists of the public's understanding of science

40

 50

- Little public understanding of what scientists do/Lack of understanding of scientific processes
- Media portray scientists inaccurately
- Misrepresentation of data by funders
- Scientific facts not presented in right way by the media/inaccurate reporting by media/misinformation by the media
- The complexity of science
- Other (please write in):.....

<input type="checkbox"/>	51
<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	56

Q9. And what, if any, would you say are the main BENEFITS to greater understanding of science among the non-specialist public? Please tick where applicable.

- Better knowledge/understanding of science is a benefit in itself
- Enables the public to judge science issues for themselves
- Enables the public to make informed decisions about their lives
- Feeling of fulfilment/Job satisfaction for scientists
- Greater understanding of what scientists do
- Greater understanding of what the MRC does
- Less opposition to scientific research
- More funding for science
- More people entering science education/science careers
- Policy-makers and decision-makers are better equipped
- Other (please write in):

<input type="checkbox"/>	57
<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	61
<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	67

Q10. What PERSONAL benefits, if any, do you see in communicating your research and its implications to the public? Please tick where applicable.

- Gives me experience in communicating
- Gets my name known
- Attracts possible funding
- Advancing the role of science
- It advances my career
- Opportunity for others to contact me for collaborative/other purposes
- None of these
- Don't know
- Other (please write in):.....

ID No.		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1		3
<input type="checkbox"/>	4	
<input type="checkbox"/>		
<input type="checkbox"/>		
<input type="checkbox"/>	8	
<input type="checkbox"/>		
<input type="checkbox"/>		
<input type="checkbox"/>	12	

Q11. What PERSONAL disadvantages, if any, do you see in communicating your research and its implications to the public? Please tick where applicable.

- Takes time/Takes too much time
- Don't feel adequately trained/equipped
- Feel nervous about talking to the public
- I might feel forced to take a particular stance
- Could be bad for my career
- My research could be reported inaccurately
- Bad reactions/jealousy from colleagues
- None of these
- Don't know
- Other (please write in):.....

<input type="checkbox"/>	13
<input type="checkbox"/>	
<input type="checkbox"/>	
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<input type="checkbox"/>	17
<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	22

Q12. Looking at communication between scientists and the non-specialist public, how strongly do you agree or disagree with the following statements? Please tick which is applicable - and make **one response to each statement, A through to I.**

A. Scientists have a duty to communicate their research and its implications to the non-specialist public

Strongly agree Tend to agree Neither Tend to disagree Strongly disagree

23

B. I would like to spend more time than I do communicating the implications of my research to non-specialist audiences

Strongly agree Tend to agree Neither Tend to disagree Strongly disagree

C. Scientists should report on any social and ethical implications of their work when they publish their research findings

Strongly agree Tend to agree Neither Tend to disagree Strongly disagree

D. Scientists have a responsibility to communicate the social and ethical implications of their research to policy-makers

Strongly agree Tend to agree Neither Tend to disagree Strongly disagree

E. The day-to-day requirements of my job leave me with too little time to carry out my research

Strongly agree Tend to agree Neither Tend to disagree Strongly disagree

27

F. Funders of scientific research should help scientists to communicate research findings and their social and ethical implications to the non-specialist public

Strongly agree Tend to agree Neither Tend to disagree Strongly disagree

28

G. Scientists should obtain assistance from professional communicators when communicating their findings to the non-specialist public

Strongly agree Tend to agree Neither Tend to disagree Strongly disagree

H. Scientists should publish findings only when they are peer-reviewed

Strongly agree Tend to agree Neither Tend to disagree Strongly disagree

I. The day-to-day requirements of my job leave me with too little time to communicate the implications of my research to others

Strongly agree Tend to agree Neither Tend to disagree Strongly disagree

31

FOR OFFICE USE 

- Talking to a journalist at a national newspaper
- Talking to a journalist at a local newspaper
- Publishing an article in the popular science press (e.g. *New Scientist*)
- Talking to a TV or radio journalist
- Writing for international/foreign press
- Writing for the national press
- Writing for the local press
- Presenting at events other than scientific conferences for scientific professionals
- Speaking at non-scientific academic conferences
- Speaking on TV/radio
- Speaking at public meetings
- Participating in open days for the general public at institutions
- None of these
- Don't know
- Other (please write in):

<input type="checkbox"/>	7
<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	14
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<input type="checkbox"/>	
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<input type="checkbox"/>	
<input type="checkbox"/>	21

Q16. Which, if any, of the following communications activities relating to public policy have you ever participated in? Please tick where applicable.

- Contributed to a response by my institution to a government advisory body or a parliamentary select committee
- Given oral evidence to a parliamentary select committee
- Contributed to a technical or policy brief aimed specifically at informing decision makers
- None of these
- Don't know
- Other (please write in):.....

<input type="checkbox"/>	22
<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	27

Q17A. During the last year have you WRITTEN for non-specialist audiences about your research? Please exclude writing for students in your field of research, e.g. articles, handouts etc.

- Yes
- No
- Don't know

<input type="checkbox"/>	28
--------------------------	----

Q17B. If yes to the above, please give your best estimate of how many times.

..... TIMES

<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
29			31

Q18. How well equipped do you PERSONALLY feel to communicate the scientific facts of your research to the non-specialist public? Please tick one response.

- Very well equipped
- Fairly well equipped
- Not very well equipped
- Not at all equipped
- Wouldn't personally do this

<input type="checkbox"/>	32
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Q19. And how well equipped do you PERSONALLY feel to communicate the social and ethical implications of your research to the non-specialist public? Please tick one response.

- Very well equipped
- Fairly well equipped
- Not very well equipped
- Not at all equipped
- Wouldn't personally do this

33

Q20. Have you ever had any training in communicating your research and its implications to the non-specialist public, or not?

- Yes
- No
- Don't know

Q21. Would you say there are any social and ethical implications for the public in your field of research, or not?

- Yes
- No
- Don't know

Q22. If yes to the above, are there:

- Many
- Some
- Hardly any

Why do you say that? (Please write in):.....

.....

.....

Q23. To what extent do you agree or disagree that the non-specialist public needs to know about the social and ethical implications of scientific research? Please tick one response.

- Strongly agree
- Tend to agree
- Tend to disagree
- Strongly disagree
- Don't know/no opinion

37

Q28. How often have you ever been interviewed or written about in a science news story, approximately?

- More than once a month
- About once a month
- Several times a year
- Once a year
- Every few years
- Never

15

Q29. When you or your work have been the source or subject of a news story, in general how satisfied have you been with the coverage? Please tick one:

- Very satisfied
- Somewhat satisfied
- Neither satisfied nor dissatisfied
- Somewhat dissatisfied
- Very dissatisfied

Q30. Why do you say that - what was the reason for your feeling that way? Please write in:

.....

.....

.....

.....

.....

Q31. How would you rate the general knowledge of the journalist that covered the story or stories that you have been involved in?

- Very knowledgeable
- Somewhat knowledgeable
- Not very knowledgeable
- Not at all knowledgeable
- Don't know/Not applicable

17

Q32. Do you have any other comments to make regarding your experiences of or feelings towards the media? Any comments will be very valuable:

.....

.....

.....

.....

Q33. In the past year how often, if at all, would you say that you personally have had difficulty responding to the VOLUME of enquiries from the press or media?

- Frequently had difficulty
- Occasionally had difficulty
- Rarely had difficulty
- Never had difficulty
- Don't know/Not applicable

18

Q34. Again, thinking about the last year, has the MRC produced any press releases or briefings in connection with your research, or not?

- Yes
- No
- Don't know/Not applicable

Q35. If yes, did you personally contribute to any of these press releases or press briefings, or not?

- Yes, contributed
- No, did not contribute
- Don't know/can't remember/Not applicable

20

Q36. Have you had any research findings or developments that you think would be suitable for an MRC press release or briefing but that have not been covered yet?

- Yes
- No
- Don't know/Not applicable

21

Q37. If yes, have you contacted the Corporate Communication Division of the MRC to discuss dissemination thereof?

- Yes
- No

22

Q38. And if no to the above, why not? Please write in:.....

.....

Q39. During the past year, did you participate in any of the following media-related events to do with MRC-supported work? Please tick where applicable.

- Press conferences
 - News releases
 - Interviews
 - Interacting with media attending scientific meetings/conferences
 - Other (please write in):.....
-
-

23

27

Q40A. Have you spent time this last year on 'public understanding of science work', e.g. popular lectures, exhibitions, interviews, etc?

- Yes
- No
- Don't know/Not applicable

28

Q40B. If yes to the above, about how much time, measured in DAYS OR PARTS THEREOF did you spend on these activities over the past year? Please give your best estimate, and write in:.....

29 31

Q41. Have you had any training in dealing with the media, or not?

- Yes
- No, never

32

Q42. Would you be interested in such training if the MRC provided it?

- Yes
- No

33

If not, why not? Please write in:

.....

Q43. What type of training do you think you need in dealing with the media? What in particular would you like training in? Please write in:

.....

Q44. Which of the following mechanisms for communicating with the non-specialist public do you think the MRC should provide? Please tick where applicable.

- Access to staff with expertise in dealing with the public
- Access to staff with expertise in dealing with the media
- Training for conference speaking
- Guidelines on communicating with the public
- Participation in science festivals/schools collaboration
- Training courses for communication with the media
- Training courses for communication with the public
- Exhibitions of current research at museums/at the MRC
- Other (please write in).....

34

 38

 42

.....

Q45A. Would you consent to being on an MRC list of expert contacts for the media?

- Yes
- No

43

Q45B. If no to the above, what are your concerns? Please write in:

.....

.....

Q46. Do you think that the MRC should formally reward researchers for disseminating their findings to and interacting with the media and other non-scientists?

- Yes
- No
- Don't know

44

If there are any comments you would like to make about this, please write in:.....

.....

.....

.....

Q47. Do you have any ideas or comments on how the MRC can further or better interact with the media about its research findings? Please write in:

.....

.....

.....

Q48. Which of the following, if any, would you say could improve communications between the general public and scientists? Please tick where applicable.

- Having financial support from my institution for communicating with the general public
- Having training for dealing with the media
- Having incentives from Funding Authorities to encourage time spent on science communication
- MRC to encourage time spent on science communication
- Appointment of specialist communicators at the MRC to talk to the public
- Appointment of specialist communicators at the MRC to talk to journalists
- Appointment of specialist communicators within Government
- Stipulation in research grants or contracts to communicate with non-specialist public
- Changes to the way in which the Research Assessment Exercise is carried out
- None of these/Don't need to improve anything
- Other (please write in).....

45

50

52

55

.....

Q49. Which, if any, of the following would YOU generally trust to provide accurate information about scientific research facts? Please tick responses in the column below:

	Trust – Facts	
Journalists working for national newspapers	<input type="checkbox"/>	56
Journalists working for the popular scientific press, e.g. <i>New Scientist</i>	<input type="checkbox"/>	
Government scientists	<input type="checkbox"/>	
Scientists working for pharmaceutical companies	<input type="checkbox"/>	
Scientists in universities	<input type="checkbox"/>	
Scientists working for health charities	<input type="checkbox"/>	
Charities and campaigning groups	<input type="checkbox"/>	62
Government advisory bodies	<input type="checkbox"/>	
MRC	<input type="checkbox"/>	
TV documentaries	<input type="checkbox"/>	
TV news and current affairs programmes	<input type="checkbox"/>	
Science books written by scientists	<input type="checkbox"/>	
Don't know	<input type="checkbox"/>	68
Other (please write in).....		69

Q50. And which, if any, would YOU generally trust to provide accurate information about the social and ethical implications of scientific research? Please tick responses in the column below:

	Trust-Social and Ethical	
Journalists working for national newspapers	<input type="checkbox"/>	4
Journalists working for the popular scientific press, e.g. <i>New Scientist</i>	<input type="checkbox"/>	5
Government scientists	<input type="checkbox"/>	
Scientists working for pharmaceutical companies	<input type="checkbox"/>	
Scientists in universities	<input type="checkbox"/>	
Scientists working for health charities	<input type="checkbox"/>	
Charities and campaigning groups	<input type="checkbox"/>	
Government advisory bodies	<input type="checkbox"/>	10
MRC	<input type="checkbox"/>	
TV documentaries	<input type="checkbox"/>	
TV news and current affairs programmes	<input type="checkbox"/>	
Science books written by scientists	<input type="checkbox"/>	
Don't know	<input type="checkbox"/>	16
Other (please write in).....		17

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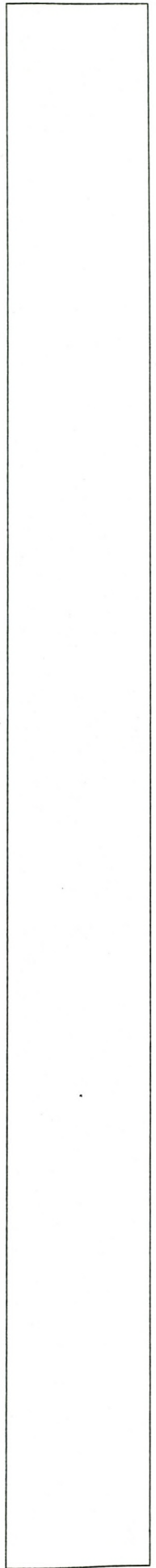
1 3

Q51. And looking again at this same list of sources of information, which, if any, do you think the General Public would generally trust to provide accurate information about scientific facts? Please indicate by ticking responses in the column below.

	General Public Trust - Scientific facts	
Journalists working for national newspapers	<input type="checkbox"/>	<input type="checkbox"/> 18
Journalists working for the popular scientific press, e.g. <i>New Scientist</i>	<input type="checkbox"/>	<input type="checkbox"/> 19
Government scientists	<input type="checkbox"/>	<input type="checkbox"/>
Scientists working for pharmaceutical companies	<input type="checkbox"/>	<input type="checkbox"/>
Scientists in universities	<input type="checkbox"/>	<input type="checkbox"/>
Scientists working for health charities	<input type="checkbox"/>	<input type="checkbox"/>
Charities and campaigning groups	<input type="checkbox"/>	<input type="checkbox"/> 24
Government advisory bodies	<input type="checkbox"/>	<input type="checkbox"/>
MRC	<input type="checkbox"/>	<input type="checkbox"/>
TV documentaries	<input type="checkbox"/>	<input type="checkbox"/>
TV news and current affairs programmes	<input type="checkbox"/>	<input type="checkbox"/>
Science books written by scientists	<input type="checkbox"/>	<input type="checkbox"/>
Don't know	<input type="checkbox"/>	<input type="checkbox"/> 30
Other (please write in):.....		<input type="checkbox"/> 31

Q52. And which, if any, do you think the General Public would generally trust to provide accurate information about the social and ethical implications of scientific research? Please indicate by ticking in the column below.

	General Public Trust - Social and ethical implications	
Journalists working for national newspapers	<input type="checkbox"/>	<input type="checkbox"/> 32
Journalists working for the popular scientific press, e.g. <i>New Scientist</i>	<input type="checkbox"/>	<input type="checkbox"/> 33
Government scientists	<input type="checkbox"/>	<input type="checkbox"/>
Scientists working for pharmaceutical companies	<input type="checkbox"/>	<input type="checkbox"/>
Scientists in universities	<input type="checkbox"/>	<input type="checkbox"/>
Scientists working for health charities	<input type="checkbox"/>	<input type="checkbox"/>
Charities and campaigning groups	<input type="checkbox"/>	<input type="checkbox"/> 38
Government advisory bodies	<input type="checkbox"/>	<input type="checkbox"/>
MRC	<input type="checkbox"/>	<input type="checkbox"/>
TV documentaries	<input type="checkbox"/>	<input type="checkbox"/>
TV news and current affairs programmes	<input type="checkbox"/>	<input type="checkbox"/>
Science books written by scientists	<input type="checkbox"/>	<input type="checkbox"/>
Don't know	<input type="checkbox"/>	<input type="checkbox"/> 44
Other (please write in):.....		<input type="checkbox"/> 45



Appendix II The survey data

MRC Programme/Division/Unit/Group/Centre at which respondents are based

Extramural units, groups and centres based at the universities	23
Intramural MRC programmes, divisions etc.	54
Short-term researchers who receive grants for projects	22

Gender

Female	42,4%
Male	57,6%

Age

25-34	15.0%	55-59	11.0%
35-44	35.0%	60-64	5.0%
45-54	33.0%	65+	1.0%

Working status

95% full-time, rest part-time or contract

Grade of position

45% division head or higher:

- 10% head of department, school or institution
- 28% programme leader or director
- 3% sub-programme leader/assistant director
- 4% division head

In addition, there were 22% specialist scientists, 15% senior scientists and 8% scientists.

The remaining 19% were junior scientists or interns/students.

Highest educational/professional qualification

Ph.D.	57,7%
Master's	21.6%
Bachelor's or honours	10.3%
M.D. or M.B. Ch.B.	10.3%

Others: M.Phil., M.Med, M.Nutrition, B.A. Cur., BA Nursing, D.Sc., F.R.C.P.

Principal source of funding for their research

MRC	50.0%
Higher education institution	6.25%
Government	5.2%
Pharmaceutical industry	5.2%
Other	33.3%

Number of articles published in peer-reviewed journals

1 to 10	29.2%
11 to 30	21.9%
30 +	48.9%

Number of authored journal articles mentioned in the lay media

0	38.9%
1 to 2	22.1%
3 to 5	13.7%
5 +	25.3%

Q1. What is your main research area or areas? Please state briefly

The researchers were working in a very wide spread of research areas:

Dentistry/oral health; Exercise science; Tuberculosis/respiratory disease/lungs; Infectious diseases; Health promotion; Nutrition/malnutrition; HIV/AIDS; Malaria/geographical information systems; Occupational health/environment; Maternal and child care/women's health; Vaccines/virology/immunology; Microbiology/molecular medicine; Psychological/psychiatric; Toxicology; Effectiveness research/health systems; Behavioural; Health policy; Liver; Inherited disorders/molecular anthropology; Cancer; Health technology; Substance abuse; Obstetrics; Ethno-/traditional medicine/natural products; Bone regeneration/disorders; Health and development/urban health; Neuroscience/neurodegenerative disorders; Health informatics; Molecular pathology; Diabetes; Chronic diseases of lifestyle; Sundry: injuries, thermal physiology, animals; Parasitology.

Each of the following areas had 7% of the responding researchers working in them:

Tuberculosis/respiratory and lung disease;
 Nutrition/malnutrition;
 HIV/AIDS;
 Malaria/geographical information systems;
 and Effectiveness research/health systems.

Q2. What does the term ‘Public Understanding of Science’ mean to you, personally?

See p. 40 of main report

Q3. If you had to communicate your research and its social and ethical implications, who do you think would be the most important group to communicate with?

The public (some specified women or mothers here, one felt it should be ‘grassroots’ people and others only the ‘educated’ public who could understand them)	28.6%
Policy makers/government/opinion leaders	28.6%
<i>A further 3% nominated both these above sectors together as most important here.</i>	
Peers/other scientists	10.2%
The media	9.2%
<i>An additional 2% nominated scientists and the public together.</i>	
Primary health care workers/health care practitioners/health organisations	7.1%
Educators and learners	6.1%
Funders, pharmaceutical companies, sports stakeholders, the University of Cape Town Department of Public Health and lobby groups each received	1.0%

Q4. Why do you say that?

See pp. 42-43 of main report

Q5. How knowledgeable do you think they are about the *science* in your research area?

Very knowledgeable	14.3%
Fairly knowledgeable	23.5%
Not very knowledgeable	47.9%
Not at all knowledgeable	14.3%

See also pp. 43-44 of main report

Q6. What level of awareness do you think they have about the *social and ethical implications* of your research area?

Very good awareness	12.1%
Fairly good awareness	25.2%
Not very good awareness	56.6%
No awareness at all	5.1%
My research has no social or ethical implications	1.0%

See also p. 44 of main report

Q7. Which of the list below, if any, would you say the non-specialist public uses to obtain information about scientific research and its social and ethical implications? (By non-specialist public is meant people with no specialist knowledge of or training in science.)

General interest magazines, e.g. women's or men's magazines	81.0%
Information published by bodies/groups such as MRC, CANSA	10.0%
Local newspapers (e.g. <i>The Cape Argus</i>)	86.0%
National newspapers (e.g. <i>The Sunday Times</i>)	78.0%
International or foreign newspapers	11.0%
Radio documentaries and current affairs programmes	58.0%
Radio dramas	18.0%
Radio news	55.0%
Scientific journals	1.0%
The 'popular' science press (e.g. <i>New Scientist</i>)	6.0%
The internet/web sites	39.0%
TV documentaries and current affairs programmes (e.g. Discovery Channel)	64.0%
TV dramas and films	30.0%
TV news	66.0%
Other	19.0%

Q8. What, if any, would you say are the main BARRIERS to greater understanding of science in general among the non-specialist public?

A lack of appreciation of how science affects them	50.0%
Biased media coverage	35.0%
Commercial or other barriers to publishing information	10.0%
Insufficient media coverage	50.0%
Lack of communication skills among scientists	53.0%
Lack of knowledge about the facts of science	41.0%
Lack of public interest / apathy / indifference	38.0%
Lack of funding	7.0%
Government policy	6.0%
Lack of education	55.0%
Lack of awareness among scientists of the public's understanding of science	44.0%
Little public understanding of what scientist do	59.0%
Media portray scientist inaccurately	24.0%
Misrepresentation of data by funders	6.0%

Scientific facts not presented in right way	43.0%
The complexity of science	38.0%
Other	16.0%

Q9. And what, if any, would you say are the main BENEFITS to greater understanding of science among the non-specialist public?

Better knowledge/understanding of science is a benefit in itself	53.0%
Enables the public to judge science issues for themselves	59.0%
Enables the public to make informed decisions about their lives	81.0%
Feeling of fulfilment/Job satisfaction for scientists	18.0%
Greater understanding of what scientists do	40.0%
Greater understanding of what the MRC does	26.0%
Less opposition to scientific research	38.0%
More funding for science	45.0%
More people entering science education/science careers	55.0%
Policy-makers and decision-makers are better equipped	64.0%
Other	9.0%

Q10. What PERSONAL benefits, if any, do you see in communicating your research and its implications to the public?

Gives me experience in communicating	41.0%
Gets my name known	22.0%
Attracts possible funding	47.0%
Advancing the role of science	65.0%
It advances my career	17.0%
Opportunity for others to contact me for collaborative purposes	49.0%
None of these	2.0%
Don't know	0.0%
Other	30.0%

Q11. What PERSONAL disadvantages, if any, do you see in communicating your research and its implications to the public?

Takes too much time	43.0%
Don't feel adequately trained	13.0%
Feel nervous about talking to the public	8.0%
I might feel forced to take a particular stance	11.0%
Could be bad for my career	2.0%

My research could be reported inaccurately	46.0%
Bad reaction from colleagues	12.0%
None of these	20.0%
Don't know	1.0%
Other	8.0%

Q12. Looking at communication between scientists and the non-specialist public, how strongly do you agree or disagree with the following statements?

A – Scientists have a duty to communicate their research and its implications to the non-specialist public

Strongly agree	56,7%
Tend to agree	36,1%
Neither	3,1%
Tend to disagree	4.1%
Strongly disagree	0.0%

B. I would like to spend more time than I do communicating the implications of my research to non-specialist audiences

Strongly agree	25.3%
Tend to agree	45.5%
Neither	16.2%
Tend to disagree	10.1%
Strongly disagree	3.0%

C. Scientists should report on any social and ethical implications of their work when they publish their research findings

Strongly agree	41.8%
Tend to agree	40.8%
Neither	8.2%
Tend to disagree	5.1%
Strongly disagree	4.1%

D. Scientists have a responsibility to communicate the social and ethical implications of their research to policy-makers

Strongly agree	62.6%
Tend to agree	30.3%

Neither	4.0%
Tend to disagree	1.0%
Strongly disagree	2.0%

E. The day-to-day requirements of my job leave me with too little time to carry out my research

Strongly agree	16.2%
Tend to agree	36.4%
Neither	21.2%
Tend to disagree	20.2%
Strongly disagree	6.0%

F. Funders of scientific research should help scientists to communicate research findings and their social and ethical implications to the non-specialist public

Strongly agree	41.4%
Tend to agree	41.4%
Neither	9.1%
Tend to disagree	8.1%
Strongly disagree	0.0%

G. Scientists should obtain assistance from professional communicators when communicating their findings to the non-specialist public

Strongly agree	30.3%
Tend to agree	45.5%
Neither	12.1%
Tend to disagree	7.1%
Strongly disagree	5.1%

H. Scientists should publish findings only when they are peer-reviewed

Strongly agree	47.5%
Tend to agree	28.3%
Neither	3.0%
Tend to disagree	16.2%
Strongly disagree	5.0%

I. The day-to-day requirements of my job leave me with too little time to communicate the implications of my research to others

Strongly agree	11.1%
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Tend to agree	47.5%
Neither	16.1%
Tend to disagree	17.2%
Strongly disagree	8.1%

Q13. Which, if any, of the following would you say are effective methods of communicating YOUR research AND its social and ethical implications to the non-specialist public? Please tick the items which apply below.

Talking at schools and colleges	48.0%
Talking to journalists in the popular science press (e.g. <i>New Scientist</i>)	39.0%
Talking to journalists at international/foreign newspapers	31.0%
Talking to journalists at national newspapers (e.g. <i>Weekly Mail, Sunday Times</i>)	71.0%
Talking to journalists at local newspapers (e.g. <i>The Cape Argus</i> etc.)	61.0%
Publishing articles in the popular science press (e.g. <i>New Scientist</i>)	26.0%
Talking to TV or radio journalists	60.0%
Writing for international/foreign press	18.0%
Writing for the national press	44.0%
Writing for the local press	40.0%
Presenting at events other than scientific conferences for scientific professionals	46.0%
Speaking at non-scientific academic conferences	34.0%
Speaking on TV/radio	59.0%
Speaking at public meetings	39.0%
Participating in open days for the general public at institutions	44.0%
None of these	1.0%
Don't know	2.0%
Other	11.0%

Q14. Which methods, if any, would you rate as the MOST EFFECTIVE for communicating YOUR research and its social and ethical implications to the non-specialist public? Please tick the items which apply below.

Talking at schools and colleges	33.0%
Talking to journalists in the popular science press (e.g. <i>New Scientist</i>)	8.0%
Talking to journalists at international/foreign newspapers	9.0%
Talking to journalists at national newspapers	46.0%
Talking to journalists at local newspapers	35.0%
Publishing articles in the popular science press (e.g. <i>New Scientist</i>)	9.0%

Talking to TV or radio journalists	45.0%
Writing for international/foreign press	7.0%
Writing for the national press	26.0%
Writing for the local press	26.0%
Presenting at events other than scientific conferences for scientific professionals	22.0%
Speaking at non-scientific academic conferences	13.0%
Speaking on TV/radio	55.0%
Speaking at public meetings	23.0%
Participating in open days for the general public at institutions	25.0%
None of these	1.0%
Don't know	3.0%
Other	9.0%

Q15. Which, if any, of the following did you participate in during the last year?

Talking at a school or college	23.0%
Talking to a journalist in the popular science press (e.g. <i>New Scientist</i>)	16.0%
Talking to a journalist at an international/foreign newspaper	19.0%
Talking to a journalist at a national newspaper	44.0%
Talking to a journalist at a local newspaper	40.0%
Publishing an article in the popular science press (e.g. <i>New Scientist</i>)	8.0%
Talking to a TV or radio journalist	35.0%
Writing for international/foreign press	2.0%
Writing for the national press	9.0%
Writing for the local press	11.0%
Presenting at events other than scientific conferences for scientific professionals	31.0%
Speaking at non-scientific academic conferences	11.0%
Speaking on TV/radio	29.0%
Speaking at public meetings	13.0%
Participating in open days for the general public at institutions	13.0%
None of these	19.0%
Don't know	0.0%
Other	12.0%

Q16. Which, if any, of the following communications activities relating to public policy have you ever participated in?

Contributed to a response by my institution to a government advisory body or a parliamentary select committee	40.0%
Given oral evidence to a parliamentary select committee	11.0%
Contributed to a technical or policy brief aimed specifically at informing decision makers	50.0%
None of these	35.0%
Don't know	2.0%
Other	7.0%

Q17A. During the last year have you WRITTEN for non-specialist audiences about your research? Please exclude writing for students in your field of research, e.g. articles, handouts etc.

Yes	40.0%
No	60.0%

Q17B. If yes to the above, please give your best estimate of how many times.

41 of the 100 scientists responded to this question. The mean number of times given was 3.3, and the maximum was 10.

Q18. How well equipped do you PERSONALLY feel to communicate the scientific facts of your research to the non-specialist public? Please tick one response.

Very well equipped	22.0%
Fairly well equipped	55.0%
Not very well equipped	21.0%
Not at all equipped	2.0%

Q19. And how well equipped do you PERSONALLY feel to communicate the social and ethical implications of your research to the non-specialist public?

Very well equipped	16.3%
Fairly well equipped	53.1%
Not very well equipped	20.4%
Not at all equipped	7.1%
Wouldn't present	3.1%

Q20. Have you ever had any training in communicating your research and its implications to the non-specialist public, or not?

Yes	17.2%
No	81.8%
Don't know	1.0%

Q21. Would you say there are any social and ethical implications for the public in your field of research, or not?

Yes	93.94%
No	3.03%
Don't know	3.03%

Q22. If yes to the above, are there:

Many	63.4%
Some	36.6%

Why do you say that?

Examples of a few responses:

“As long as one deals with human beings there are ethical implications”

“There are social and ethical implications in *ALL* science”

“Our country is confronted with the biggest health crisis in its history and we have a big role to play in trying to address the crisis”

“Public participation in our research requires their informed consent. Informed consent can only be given if they have a thorough understanding of the research activity and their participation.”

“Patient concerns are always ethical and social matters. Educational implications of my research have similar impacts on the paying public.”

Q23. To what extent do you agree or disagree that the non-specialist public needs to know about the social and ethical implications of scientific research?

Strongly agree	57.1%
Tend to agree	33.7%
Tend to disagree	6.1%
Strongly disagree	0.0%
Don't know/no opinion	3.1%

Q24. In your opinion, who, if any, of the following should have the MAIN RESPONSIBILITY for communicating the social and ethical implications of scientific research to the non-specialist public?

Charities and campaigning groups (e.g. on environment and health)	13.0%
Ethicists	13.0%
Funders of scientific research	35.0%
Government	23.0%
Journalists in the broadcast media	27.0%
Journalists in the international/foreign press	15.0%
Journalists in the national press	31.0%
Journalists in the local press	28.0%
Journalists in the popular science press (e.g. <i>New Scientist</i>)	18.0%
Politicians	7.0%
Religious groups	2.0%
Scientists themselves	70.0%
Social scientists	14.0%
Specialist science communicators	49.0%
None of these	0.0%
Don't know	1.0%
Other	3.0%

Why did you choose them?

See p. 51 of main report

Q25. And in your opinion, who would you say is BEST equipped to communicate the social and ethical implications of scientific research findings to the non-specialist public? Again, please select a maximum of four below.

Charities and campaigning groups (e.g. on environment and health)	12.0%
Ethicists	11.0%
Funders of scientific research	19.0%
Government	10.0%
Journalists in the broadcast media	20.0%
Journalists in the international/foreign press	11.0%
Journalists in the national press	21.0%
Journalists in the local press	17.0%

Journalists in the popular science press (e.g. <i>New Scientist</i>)	15.0%
Politicians	1.0%
Religious groups	1.0%
Scientists themselves	45.0%
Social scientists	15.0%
Specialist science communicators	52.0%
None of these	0.0%
Don't know	4.0%
Other	4.0%

Why did you choose them?

See p. 52 of main report

Q26. How do you rate the general coverage of science and technology in the following news media?

The international news programme/channel that you watch most often?

Poor	20.5%
Fair	28.4%
Good	43.2%
Excellent	8.0%

The national TV news programme or channel you watch most often?

Poor	60.0%
Fair	32.6%
Good	7.4%
Excellent	0.0%

The national newspaper that you read most often?

Poor	24.2%
Fair	46.1%
Good	19.8%
Excellent	9.9%

The national radio broadcast that you listen to most often?

Poor	42.4%
Fair	42.4%

Good	12.1%
Excellent	3.0%

The news magazine that you read most often?

Poor	60.2%
Fair	29.6%
Good	10.2%
Excellent	0.0%

The local newspaper that you read most often?

Poor	40.6%
Fair	40.6%
Good	18.7%
Excellent	0.0%

The local radio station that you listen to for news most often?

Poor	57.5%
Fair	33.3%
Good	9.2%
Excellent	0.0%

Q27A. Thinking about the last year, have you personally talked to the press or media about research in your field?

Yes	56.0%
No	42.0%
Don't know	2.0%

Q27B. If yes to the above, please give your best estimate of how many times.

55 of the 100 scientists responded to this question. The mean number of times was 7.5, with a maximum of 100 (second highest = 52).

Q28. How often have you ever been interviewed or written about in a science news story, approximately?

More than once a month	3.0%
About once a month	3.0%
Several times a year	22.0%
Once a year	19.0%

Every few years	29.0%
Never	24.0%

Q29. When you or your work have been the source or subject of a news story, in general how satisfied have you been with the coverage? Please tick one:

Very satisfied	8.3%
Somewhat satisfied	57.1%
Neither satisfied nor dissatisfied	14.3%
Somewhat dissatisfied	16.7%
Very dissatisfied	3.6%

Q30. Why do you say that - what was the reason for your feeling that way?

See pp. 57-60 of main report

Q31. How would you rate the general knowledge of the journalist that covered the story or stories that you have been involved in?

Very knowledgeable	5.4%
Somewhat knowledgeable	28.3%
Not very knowledgeable	41.3%
Not at all knowledgeable	7.6%
Don't know/Not applicable	17.4%

Q32. Do you have any other comments to make regarding your experiences of or feelings towards the media? Any comments will be very valuable:

See pp. 62-64 of main report

Q33. In the past year how often, if at all, would you say that you personally have had difficulty responding to the VOLUME of enquiries from the press or media?

Frequently had difficulty	9.0%
Occasionally had difficulty	11.0%
Rarely had difficulty	20.0%
Never had difficulty	24.0%
Don't know/Not applicable	36.0%

Q34. Again, thinking about the last year, has the MRC produced any press releases or briefings in connection with your research, or not?

Yes	37.0%
No	45.0%
Don't know/Not applicable	18.0%

Q35. If yes, did you personally contribute to any of these press releases or press briefings, or not?

Yes, contributed	37.0%
No, did not contribute	22.2%
Don't know/can't remember/	
Not applicable	40.7%

Q36. Have you had any research findings or developments that you think would be suitable for an MRC press release or briefing but that have not been covered yet?

Yes	37.1%
No	39.2%
Don't know/Not applicable	23.7%

Q37. If yes, have you contacted the Corporate Communication Division of the MRC to discuss dissemination thereof?

Yes	15,0%
No	85,0%

Q38. And if no to the above, why not?

See p. 69 of main report

Q39. During the past year, did you participate in any of the following media-related events to do with MRC-supported work? Please tick where applicable.

Press conferences	6.0%
News releases	9.0%
Interviews	21.0%
Interacting with media attending	
scientific meetings/conferences	27.0%
Other	7.0%

Q40A. Have you spent time this last year on ‘public understanding of science work’, e.g. popular lectures, exhibitions, interviews, etc?

Yes	35.3%
No	56.6%
Don't know/Not applicable	8.1%

Q40B. If yes to the above, about how much time, measured in DAYS OR PARTS THEREOF did you spend on these activities over the past year? Please give your best estimate, and write in:

32 of the 100 scientists responded to this question. The mean number of days given was 12.7.

Q41. Have you had any training in dealing with the media, or not?

Yes	13.1%
No, never	86.9%

Q42. Would you be interested in such training if the MRC provided it?

Yes	80.8%
No	19.2%

If not, why not? Please write in:

See p. 65 of main report

Q43. What type of training do you think you need in dealing with the media? What in particular would you like training in? Please write in:

See pp. 66-67 of main report

Q44. Which of the following mechanisms for communicating with the non-specialist public do you think the MRC should provide? Please tick where applicable.

Access to staff with expertise in dealing with the public	51.0%
Access to staff with expertise in dealing with the media	63.0%
Training for conference speaking	40.0%
Guidelines on communicating with the public	59.0%
Participation in science festivals/schools collaboration	33.0%
Training courses for communication with the media	63.0%
Training courses for communication with the public	45.0%
Exhibitions of current research at museums/at the MRC	27.0%
Other	4.0%

Q45A. Would you consent to being on an MRC list of expert contacts for the media?

Yes	67.0%
No	33.0%

Q45B. If no to the above, what are your concerns?

See p. 67 of main report

Q46. Do you think that the MRC should formally reward researchers for disseminating their findings to and interacting with the media and other non-scientists?

Yes	45.9%
No	40.8%
Don't know	13.3%

If there are any comments you would like to make about this, please write in:

See p. 69-70 of main report

Q47. Do you have any ideas or comments on how the MRC can further or better interact with the media about its research findings?

See p. 72-74 of main report

Q48. Which of the following, if any, would you say could improve communications between the general public and scientists? Please tick where applicable.

Having financial support from my institution for communicating with the general public	29.0%
Having training for dealing with the media	56.0%
Having incentives from Funding Authorities to encourage time spent on science communication	41.0%
MRC to encourage time spent on science communication	48.0%
Appointment of specialist communicators at the MRC to talk to the public	36.0%
Appointment of specialist communicators at the MRC to talk to journalists	50.0%
Appointment of specialist communicators within Government	28.0%
Stipulation in research grants or contracts to communicate with non-specialist public	25.0%
Changes to the way in which the Research Assessment Exercise is carried out	10.0%
None of these/Don't need to improve anything	3.0%
Other	8.0%

Q49. Which, if any, of the following would YOU generally trust to provide accurate information about scientific research facts? Please tick responses in the column below:

	Trust –Facts
Journalists working for national newspapers	5.0%
Journalists working for the popular scientific press, e.g. <i>New Scientist</i>	44.0%
Government scientists	18.0%
Scientists working for pharmaceutical companies	16.0%
Scientists in universities	77.0%
Scientists working for health charities	32.0%
Charities and campaigning groups	4.0%
Government advisory bodies	17.0%
MRC	81.0%
TV documentaries	15.0%
TV news and current affairs programmes	8.0%
Science books written by scientists	62.0%
Don't know	3.0%
Other	8.0%

Q50. And which, if any, would YOU generally trust to provide accurate information about the social and ethical implications of scientific research? Please tick responses in the column below:

	Trust - Social and Ethical
Journalists working for national newspapers	7.0%
Journalists working for the popular scientific press, e.g. <i>New Scientist</i>	32.0%
Government scientists	15.0%
Scientists working for pharmaceutical companies	10.0%
Scientists in universities	61.0%
Scientists working for health charities	29.0%
Charities and campaigning groups	14.0%
Government advisory bodies	20.0%
MRC	69.0%
TV documentaries	14.0%
TV news and current affairs programmes	7.0%
Science books written by scientists	40.0%
Don't know	7.0%
Other	7.0%

Q51. And looking again at this same list of sources of information, which, if any, do you think the General Public would generally trust to provide accurate information about scientific facts? Please indicate by ticking responses in the column below.

	General Public Trust - Scientific facts
Journalists working for national newspapers	43.0%
Journalists working for the popular scientific press, <i>e.g. New Scientist</i>	51.0%
Government scientists	35.0%
Scientists working for pharmaceutical companies	25.0%
Scientists in universities	70.0%
Scientists working for health charities	38.0%
Charities and campaigning groups	37.0%
Government advisory bodies	32.0%
MRC	69.0%
TV documentaries	58.0%
TV news and current affairs programmes	56.0%
Science books written by scientists	49.0%
Don't know	8.0%
Other	8.0%

Q52. And which, if any, do you think the General Public would generally trust to provide accurate information about the social and ethical implications of scientific research? Please indicate by ticking in the column below.

	General Public Trust - Social and ethical implications
Journalists working for national newspapers	38.0%
Journalists working for the popular scientific press, <i>e.g. New Scientist</i>	43.0%
Government scientists	34.0%
Scientists working for pharmaceutical companies	15.0%
Scientists in universities	52.0%
Scientists working for health charities	40.0%
Charities and campaigning groups	36.0%
Government advisory bodies	28.0%
MRC	56.0%
TV documentaries	48.0%
TV news and current affairs programmes	46.0%

Science books written by scientists	40.0%
Don't know	12.0%
Other	6.0%

Fifty-two per cent of the respondents were happy to have their responses attributed to them by name.

MRC scientists and the media - questionnaire

Thank you so much for giving of your time to complete this questionnaire. All responses will be kept confidential, although you may indicate your name if you wish. There are no right or wrong answers - what I am after is your opinion.

This is the first time a detailed study into specifically scientists and the media has been carried out in South Africa. Your input is therefore *extremely* valuable.

The questionnaire has 52 questions in all, and should take around 20 minutes to complete. Please return it to me by 18 August.

Leverne Gething
 Corporate Communication
 MRC
 PO Box 19070
 Tygerberg
 7505

First I need to know a bit about you.

MRC Programme/Division/Unit/Group Centre:.....

4

University/Institution name:.....

6

Gender: Male Female

8

Age: Under 25 25-34 35-44 45-54 55-59 60-64 65+

Working status:

Full-time Part-time Other.....

Is your contract Permanent Term Other.....

Grade:

- Head of Department/School/Institution
- Group Executive/Exec. Director
- Programme leader/Lead programme leader/Director of Unit
- Sub-Programme leader/Assistant Director
- Division Head
- Specialist scientist
- Senior scientist
- Scientist
- Junior scientist
- Research intern
- Other (please write in).....

12 13

What is the highest educational/professional qualification you have obtained?

.....

15

FOR OFFICE USE

What is the principal source of funding for your research?

- Wholly or principally funded by the MRC
- Wholly or principally funded by government
- Wholly or principally funded by a higher education institution
- Wholly or principally funded by a pharmaceutical company
- Other principal source of funding - please indicate:.....

16

Number of articles published in peer-reviewed journals?

- 1-10
- 11-30
- more than 30

Number of authored journal articles mentioned in the lay media?

- 0
- 1-2
- 3-5
- more than 5

18

Thank you. Remember, all your responses will be kept strictly confidential if you wish. Names will only be used if express permission is given at the end of this questionnaire.

Q1. What is your main research area or areas? Please state briefly, e.g. cardiovascular medicine, health systems research.

.....

20

Q2. What does the term 'Public Understanding of Science' mean to you, personally?

.....

.....

.....

Q3. If you had to communicate your research and its social and ethical implications, who do you think would be the most important group to communicate with?

.....

22

Q4. Why do you say that?

.....

.....

Q5. How knowledgeable do you think they are about the *science* in your research area?

- Very knowledgeable
- Fairly knowledgeable
- Not very knowledgeable
- Not at all knowledgeable

23

Q6. What level of awareness do you think they have about the *social and ethical implications* of your research area?

- Very good awareness
- Fairly good awareness
- Not very good awareness
- No awareness at all
- My research has no social or ethical implications

24

Q7. Below is a list of sources of information. Which, if any, would you say the non-specialist public uses to obtain information about scientific research and its social and ethical implications? (By non-specialist public I mean people with no specialist knowledge of or training in science.) Please tick where applicable.

- General interest magazines, e.g. women's or men's magazines
- Information published by bodies/groups such as MRC, CANSA etc
- Local newspapers (e.g. *The Cape Argus*)
- National newspapers (e.g. *The Sunday Times*)
- International or foreign newspapers
- Radio documentaries and current affairs programmes
- Radio dramas
- Radio news
- Scientific journals
- The 'popular' science press (e.g. *New Scientist*)
- The internet/web sites
- TV documentaries and current affairs programmes (e.g. Discovery Channel)
- TV dramas and films
- TV news
- Other (please write in)

25

 30

 39

Q8. What, if any, would you say are the main BARRIERS to greater understanding of science in general among the non-specialist public? Please tick where applicable.

- A lack of appreciation (among the non-specialist public) of how science affects them
- Biased media coverage
- Commercial or other barriers to publishing information
- Insufficient media coverage
- Lack of communication skills among scientists
- Lack of knowledge about the facts of science/Lack of information
- Lack of public interest/apathy/indifference
- Lack of funding
- Government policy
- Lack of education
- Lack of awareness among scientists of the public's understanding of science

40

 50

- Little public understanding of what scientists do/Lack of understanding of scientific processes
- Media portray scientists inaccurately
- Misrepresentation of data by funders
- Scientific facts not presented in right way by the media/inaccurate reporting by media/misinformation by the media
- The complexity of science
- Other (please write in):.....

Q9. And what, if any, would you say are the main BENEFITS to greater understanding of science among the non-specialist public? Please tick where applicable.

- Better knowledge/understanding of science is a benefit in itself
- Enables the public to judge science issues for themselves
- Enables the public to make informed decisions about their lives
- Feeling of fulfilment/Job satisfaction for scientists
- Greater understanding of what scientists do
- Greater understanding of what the MRC does
- Less opposition to scientific research
- More funding for science
- More people entering science education/science careers
- Policy-makers and decision-makers are better equipped
- Other (please write in):

Q10. What PERSONAL benefits, if any, do you see in communicating your research and its implications to the public? Please tick where applicable.

- Gives me experience in communicating
- Gets my name known
- Attracts possible funding
- Advancing the role of science
- It advances my career
- Opportunity for others to contact me for collaborative/other purposes
- None of these
- Don't know
- Other (please write in):.....

Q11. What PERSONAL disadvantages, if any, do you see in communicating your research and its implications to the public? Please tick where applicable.

- Takes time/Takes too much time
- Don't feel adequately trained/equipped
- Feel nervous about talking to the public
- I might feel forced to take a particular stance
- Could be bad for my career
- My research could be reported inaccurately
- Bad reactions/jealousy from colleagues
- None of these
- Don't know
- Other (please write in):.....

51
56
57
61
67
ID No.
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12
13
17
22

Q12. Looking at communication between scientists and the non-specialist public, how strongly do you agree or disagree with the following statements? Please tick which is applicable - and make one response to each statement, A through to I.

A. Scientists have a duty to communicate their research and its implications to the non-specialist public

Strongly agree Tend to agree Neither Tend to disagree Strongly disagree

23

B. I would like to spend more time than I do communicating the implications of my research to non-specialist audiences

Strongly agree Tend to agree Neither Tend to disagree Strongly disagree

C. Scientists should report on any social and ethical implications of their work when they publish their research findings

Strongly agree Tend to agree Neither Tend to disagree Strongly disagree

D. Scientists have a responsibility to communicate the social and ethical implications of their research to policy-makers

Strongly agree Tend to agree Neither Tend to disagree Strongly disagree

E. The day-to-day requirements of my job leave me with too little time to carry out my research

Strongly agree Tend to agree Neither Tend to disagree Strongly disagree

27

F. Funders of scientific research should help scientists to communicate research findings and their social and ethical implications to the non-specialist public

Strongly agree Tend to agree Neither Tend to disagree Strongly disagree

28

G. Scientists should obtain assistance from professional communicators when communicating their findings to the non-specialist public

Strongly agree Tend to agree Neither Tend to disagree Strongly disagree

H. Scientists should publish findings only when they are peer-reviewed

Strongly agree Tend to agree Neither Tend to disagree Strongly disagree

I. The day-to-day requirements of my job leave me with too little time to communicate the implications of my research to others

Strongly agree Tend to agree Neither Tend to disagree Strongly disagree

31

FOR OFFICE USE 

- Talking to a journalist at a national newspaper
- Talking to a journalist at a local newspaper
- Publishing an article in the popular science press (e.g. *New Scientist*)
- Talking to a TV or radio journalist
- Writing for international/foreign press
- Writing for the national press
- Writing for the local press
- Presenting at events other than scientific conferences for scientific professionals
- Speaking at non-scientific academic conferences
- Speaking on TV/radio
- Speaking at public meetings
- Participating in open days for the general public at institutions
- None of these
- Don't know
- Other (please write in):

7
14
21

Q16. Which, if any, of the following communications activities relating to public policy have you ever participated in? Please tick where applicable.

- Contributed to a response by my institution to a government advisory body or a parliamentary select committee
- Given oral evidence to a parliamentary select committee
- Contributed to a technical or policy brief aimed specifically at informing decision makers
- None of these
- Don't know
- Other (please write in):.....

22
27

Q17A. During the last year have you WRITTEN for non-specialist audiences about your research? Please exclude writing for students in your field of research, e.g. articles, handouts etc.

- Yes
- No
- Don't know

28

Q17B. If yes to the above, please give your best estimate of how many times.

..... TIMES

29		31

Q18. How well equipped do you PERSONALLY feel to communicate the scientific facts of your research to the non-specialist public? Please tick one response.

- Very well equipped
- Fairly well equipped
- Not very well equipped
- Not at all equipped
- Wouldn't personally do this

32

<input type="checkbox"/> 33
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/> 37

Q19. And how well equipped do you PERSONALLY feel to communicate the social and ethical implications of your research to the non-specialist public? Please tick one response.

- Very well equipped
- Fairly well equipped
- Not very well equipped
- Not at all equipped
- Wouldn't personally do this

Q20. Have you ever had any training in communicating your research and its implications to the non-specialist public, or not?

- Yes
- No
- Don't know

Q21. Would you say there are any social and ethical implications for the public in your field of research, or not?

- Yes
- No
- Don't know

Q22. If yes to the above, are there:

- Many
- Some
- Hardly any

Why do you say that? (Please write in):.....

.....

.....

Q23. To what extent do you agree or disagree that the non-specialist public needs to know about the social and ethical implications of scientific research? Please tick one response.

- Strongly agree
- Tend to agree
- Tend to disagree
- Strongly disagree
- Don't know/no opinion

Q26. How do you rate the general coverage of science and technology in the following news media? Please tick one response per item.

The international news programme/channel that you watch most often?

- Poor Fair Good Excellent

The national TV news programme or channel you watch most often?

- Poor Fair Good Excellent

The news magazine that you read most often?

- Poor Fair Good Excellent

The national newspaper that you read most often?

- Poor Fair Good Excellent

The local newspaper that you read most often?

- Poor Fair Good Excellent

The national radio broadcast that you listen to most often?

- Poor Fair Good Excellent

The local radio station that you listen to for news most often?

- Poor Fair Good Excellent

Q27A. Thinking about the last year, have you personally talked to the press or media about research in your field?

- Yes
 No
 Don't know

Q27B. If yes to the above, please give your best estimate of how many times.

.....TIMES

ID No.

1 3

4

8

11

12 14

Q28. How often have you ever been interviewed or written about in a science news story, approximately?

- More than once a month
- About once a month
- Several times a year
- Once a year
- Every few years
- Never

15

Q29. When you or your work have been the source or subject of a news story, in general how satisfied have you been with the coverage? Please tick one:

- Very satisfied
- Somewhat satisfied
- Neither satisfied nor dissatisfied
- Somewhat dissatisfied
- Very dissatisfied

Q30. Why do you say that - what was the reason for your feeling that way? Please write in:

.....

.....

.....

.....

.....

Q31. How would you rate the general knowledge of the journalist that covered the story or stories that you have been involved in?

- Very knowledgeable
- Somewhat knowledgeable
- Not very knowledgeable
- Not at all knowledgeable
- Don't know/Not applicable

17

Q32. Do you have any other comments to make regarding your experiences of or feelings towards the media? Any comments will be very valuable:

.....

.....

.....

.....

Q33. In the past year how often, if at all, would you say that you personally have had difficulty responding to the VOLUME of enquiries from the press or media?

- Frequently had difficulty
- Occasionally had difficulty
- Rarely had difficulty
- Never had difficulty
- Don't know/Not applicable

18

Q34. Again, thinking about the last year, has the MRC produced any press releases or briefings in connection with your research, or not?

- Yes
- No
- Don't know/Not applicable

Q35. If yes, did you personally contribute to any of these press releases or press briefings, or not?

- Yes, contributed
- No, did not contribute
- Don't know/can't remember/Not applicable

20

Q36. Have you had any research findings or developments that you think would be suitable for an MRC press release or briefing but that have not been covered yet?

- Yes
- No
- Don't know/Not applicable

21

Q37. If yes, have you contacted the Corporate Communication Division of the MRC to discuss dissemination thereof?

- Yes
- No

22

Q38. And if no to the above, why not? Please write in:.....

.....

Q39. During the past year, did you participate in any of the following media-related events to do with MRC-supported work? Please tick where applicable.

- Press conferences
 - News releases
 - Interviews
 - Interacting with media attending scientific meetings/conferences
 - Other (please write in):.....
-
-

23

27

Q40A. Have you spent time this last year on 'public understanding of science work', e.g. popular lectures, exhibitions, interviews, etc?

- Yes
- No
- Don't know/Not applicable

28

Q40B. If yes to the above, about how much time, measured in DAYS OR PARTS THEREOF did you spend on these activities over the past year? Please give your best estimate, and write in:.....

29 31

Q41. Have you had any training in dealing with the media, or not?

- Yes
- No, never

32

Q42. Would you be interested in such training if the MRC provided it?

- Yes
- No

33

If not, why not? Please write in:

.....

Q43. What type of training do you think you need in dealing with the media? What in particular would you like training in? Please write in:

.....

Q44. Which of the following mechanisms for communicating with the non-specialist public do you think the MRC should provide? Please tick where applicable.

- Access to staff with expertise in dealing with the public
- Access to staff with expertise in dealing with the media
- Training for conference speaking
- Guidelines on communicating with the public
- Participation in science festivals/schools collaboration
- Training courses for communication with the media
- Training courses for communication with the public
- Exhibitions of current research at museums/at the MRC
- Other (please write in).....

34

38

42

.....

Q45A. Would you consent to being on an MRC list of expert contacts for the media?

- Yes
- No

43

Q45B. If no to the above, what are your concerns? Please write in:

.....

.....

Q46. Do you think that the MRC should formally reward researchers for disseminating their findings to and interacting with the media and other non-scientists?

- Yes
- No
- Don't know

44

If there are any comments you would like to make about this, please write in:.....

.....

.....

.....

Q47. Do you have any ideas or comments on how the MRC can further or better interact with the media about its research findings? Please write in:

.....

.....

.....

Q48. Which of the following, if any, would you say could improve communications between the general public and scientists? Please tick where applicable.

- Having financial support from my institution for communicating with the general public
- Having training for dealing with the media
- Having incentives from Funding Authorities to encourage time spent on science communication
- MRC to encourage time spent on science communication
- Appointment of specialist communicators at the MRC to talk to the public
- Appointment of specialist communicators at the MRC to talk to journalists
- Appointment of specialist communicators within Government
- Stipulation in research grants or contracts to communicate with non-specialist public
- Changes to the way in which the Research Assessment Exercise is carried out
- None of these/Don't need to improve anything
- Other (please write in).....

45

50

52

55

.....

Q49. Which, if any, of the following would YOU generally trust to provide accurate information about scientific research facts? Please tick responses in the column below:

	Trust – Facts
Journalists working for national newspapers	<input type="checkbox"/>
Journalists working for the popular scientific press, e.g. <i>New Scientist</i>	<input type="checkbox"/>
Government scientists	<input type="checkbox"/>
Scientists working for pharmaceutical companies	<input type="checkbox"/>
Scientists in universities	<input type="checkbox"/>
Scientists working for health charities	<input type="checkbox"/>
Charities and campaigning groups	<input type="checkbox"/>
Government advisory bodies	<input type="checkbox"/>
MRC	<input type="checkbox"/>
TV documentaries	<input type="checkbox"/>
TV news and current affairs programmes	<input type="checkbox"/>
Science books written by scientists	<input type="checkbox"/>
Don't know	<input type="checkbox"/>
Other (please write in).....	

<input type="checkbox"/>	56
<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	62
<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	68
<input type="checkbox"/>	
<input type="checkbox"/>	69

Q50. And which, if any, would YOU generally trust to provide accurate information about the social and ethical implications of scientific research? Please tick responses in the column below:

	Trust-Social and Ethical
Journalists working for national newspapers	<input type="checkbox"/>
Journalists working for the popular scientific press, e.g. <i>New Scientist</i>	<input type="checkbox"/>
Government scientists	<input type="checkbox"/>
Scientists working for pharmaceutical companies	<input type="checkbox"/>
Scientists in universities	<input type="checkbox"/>
Scientists working for health charities	<input type="checkbox"/>
Charities and campaigning groups	<input type="checkbox"/>
Government advisory bodies	<input type="checkbox"/>
MRC	<input type="checkbox"/>
TV documentaries	<input type="checkbox"/>
TV news and current affairs programmes	<input type="checkbox"/>
Science books written by scientists	<input type="checkbox"/>
Don't know	<input type="checkbox"/>
Other (please write in).....	

ID No.

1 3

<input type="checkbox"/>	4
<input type="checkbox"/>	5
<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	10
<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	16
<input type="checkbox"/>	
<input type="checkbox"/>	17

Q51. And looking again at this same list of sources of information, which, if any, do you think the General Public would generally trust to provide accurate information about scientific facts? Please indicate by ticking responses in the column below.

	General Public Trust - Scientific facts	
Journalists working for national newspapers	<input type="checkbox"/>	18
Journalists working for the popular scientific press, e.g. <i>New Scientist</i>	<input type="checkbox"/>	19
Government scientists	<input type="checkbox"/>	
Scientists working for pharmaceutical companies	<input type="checkbox"/>	
Scientists in universities	<input type="checkbox"/>	
Scientists working for health charities	<input type="checkbox"/>	
Charities and campaigning groups	<input type="checkbox"/>	24
Government advisory bodies	<input type="checkbox"/>	
MRC	<input type="checkbox"/>	
TV documentaries	<input type="checkbox"/>	
TV news and current affairs programmes	<input type="checkbox"/>	
Science books written by scientists	<input type="checkbox"/>	
Don't know	<input type="checkbox"/>	30
Other (please write in):.....		31

Q52. And which, if any, do you think the General Public would generally trust to provide accurate information about the social and ethical implications of scientific research? Please indicate by ticking in the column below.

	General Public Trust - Social and ethical implications	
Journalists working for national newspapers	<input type="checkbox"/>	32
Journalists working for the popular scientific press, e.g. <i>New Scientist</i>	<input type="checkbox"/>	33
Government scientists	<input type="checkbox"/>	
Scientists working for pharmaceutical companies	<input type="checkbox"/>	
Scientists in universities	<input type="checkbox"/>	
Scientists working for health charities	<input type="checkbox"/>	
Charities and campaigning groups	<input type="checkbox"/>	
Government advisory bodies	<input type="checkbox"/>	38
MRC	<input type="checkbox"/>	
TV documentaries	<input type="checkbox"/>	
TV news and current affairs programmes	<input type="checkbox"/>	
Science books written by scientists	<input type="checkbox"/>	
Don't know	<input type="checkbox"/>	44
Other (please write in):.....		45



