Mobile Telephony and Health

Research Study

Conducted for the

GSM Association,

Mobile Manufacturers

Forum, and Mobile

Operators Association

Public Perceptions in Great Britain

February 2004

GSM ASSOCIATION

moa
mobile
operators
association
responsible
network
development

MMF
Mobile Manufacturers
Forum

MORI

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Introduction

This report presents the findings of research conducted on behalf of the GSM Association (GSMA), the Mobile Manufacturers Forum (MMF) and the Mobile Operators Association (MOA), regarding the British general public's attitudes to the alleged health risks associated with mobile phone handsets and masts. The views expressed in the report are MORI's, rather than those of any of the sponsors of the report, and represent our interpretation of the findings of the research, quantitative and qualitative. Several additional sources and studies have been used in this report including research conducted by MORI for Motorola, the University of East Anglia and the British Medical Association. Further details of the additional studies referred to are given in the appendices.

The main objectives of the GSMA/MMF/MOA/MORI research are to:

- understand the British public's awareness and perceptions of the alleged health risks associated with the use of mobile phones
- to track changes in this awareness and perceptions
- to monitor the effect of media coverage
- to test reaction to proposed government and industrial initiatives
- to understand attitudes towards use of mobile phones by children

The general public quantitative tracking research has been taking place on a regular basis over the last 6 years. It was originally commissioned by Cellnet in 1998 and then the Mobile Operators Association (formerly the Federation of Electronics Industry). Since 2000 two waves a year have been conducted, with occasional extra measures as required.

The quantitative research is conducted via MORI's Face-to-Face Omnibus. Each wave of research interviews a nationally representative quota sample of British adults aged 15+ throughout Great Britain (England, Scotland and Wales, but excluding Northern Ireland). Interviews are carried out using CAPI (Computer Assisted Personal Interviewing), face-to-face in respondents' homes. Data have been weighted to reflect the known national population profile. Details of sample sizes, fieldwork dates and number of sample points interviewed in are given in the table overleaf:

	Sample Size	Fieldwork Dates	Sample points
August 1999	1,949	20 – 23 August 1999	165
March 2000	1,780	23 – 27 March 2000	160
August/September 2000	1,901	31 August – 6 September 2000	190
January 2001	2,073	4 – 8 January 2001	194
March 2001 (1)	1,857	15 – 21 March 2001	188
March 2001 (2)	958/1,039	22 – 27 March 2001	189
August 2001	2,009	9 – 14 August 2001	194
March 2002	1,987	7 – 11 March 2002	193
August 2002	1,944	22 – 28 August 2002	187
April 2003	1,885	3 – 8 April 2003	191
September 2003	2,046	11 – 16 September 2003	187
December 2003	1,511*	11 – 17 December 2003	197

*Mobile phone users only

Qualitative research has also been conducted since 2000 involving focus groups for the first three years and in 2003 a day long workshop was held. Participants in all cases were mobile phone users who were aware of the claimed health issues surrounding mobile phones and masts. Relevant quotes from the focus groups have been used in this report.

Executive Summary

The public's perceptions

- Alleged health-related dangers from mobile phone handsets or masts are a "top-of-the-mind" concern for only about one in twenty of the population. However, when prompted, between one in four and one in five of the public express themselves concerned about alleged health-related dangers from mobile phone handsets or masts.

- Although broadly similar numbers express concerns about the potential risk from handsets compared to masts, the depth of their concern is not the same – most seem to feel that masts are more dangerous than handsets, and should be more stringently regulated as a result.

- Children are thought to be more vulnerable to the perceived dangers than adults.

- However there is a consistent downward trend in the belief that handsets pose a risk – significantly fewer people now believe that mobile phones are unsafe to use than did so a couple of years ago. This probably simply reflects increasing familiarity: many of the public are credulous, and mobiles are new technology, so initial suspicion is inevitable. This can be expected to diminish over time, as is already happening, but is unlikely to fall away to zero.

- There is as yet no corresponding falling-off in suspicion of masts.

Effect on the public's behaviour

- Nevertheless, the public seems to perceive that the level of risk involved in using mobile phones is tolerable – phones are seen as a necessity and perceptions of risk do not seem to be inhibiting people from having mobile phones. Even among those who believe handsets or masts pose a risk, the majority agree that mobile phones are "a necessity of modern life".

- Non-users of mobile phones are for the most part those who feel they don't need one; just 1% of the public say that they do not use a mobile phone because of "potential health risks".

- Even so, one in five mobile users disagree that "The benefits of using a mobile phone are greater than any potential health risks" and a similar proportion cannot agree that "Health concerns about mobile phones do not affect how much I use my phone", suggesting that the extent of mobile phone use might be somewhat restricted by health fears even if the number of people who use them is not.

- There is less easy acceptance of the perceived risks that are posed by masts, and three-quarters of the public say they would object were a mast to be placed on a local school or similar building where it would be close to children.

- Only a minority of the public understand the need for masts to enable mobile phones to operate.

- Camouflaging masts seems to _increase_ public suspicion significantly, such is the inherent distrust of the operators' motives.

Sources and causes of health fears

- The prominence of the issue on the public's agenda varies greatly, more so than is the case for a number of other similar issues. These variations are likely to be media-driven, and those who believe that mobile phones are unsafe tend to cite the media – national and local newspapers as well as television – as the sources from which they derive their information.

- However, the underlying fear that there may be a health risk, as opposed to the day-to-day immediate level of concern, is considerably more stable, and this may point to its being less vulnerable to short-term events such as the impact of individual items of media coverage.

- Concern about masts and handsets is closely related, with those who believe the one to be dangerous considerably more likely than average to believe the same of the other. This suggests that some of the belief in health risks arises not from interpretation of the scientific evidence or from specific scare stories, but from a more general disbelief in the credibility of those who deny that there is a risk.

Children and mobile phones

- The majority of the public are hostile to children using mobile phones, though this hostility seems to be falling slightly.

- However, opposition to children's use of phones is not based solely on health fears. (Many of those who think mobile phones are safe would nevertheless ban their use by children.) A significant factor is probably a wider-ranging disapproval of the way companies of all sorts market their goods to children, which may establish a presumption against commercial companies regardless of the nature of their products. There may also be a fear of a wider social harm to children from using mobile phones, perhaps by increasing their vulnerability to crime, or by affecting their educational and social development. It may also arise from a feeling that children's use of mobiles causes unnecessary nuisance to others.

- Parents are no more opposed to children having mobile phones than are other adults. Furthermore, many parents are appreciative of the advantages of being able to make contact in emergencies, in a world where many of the dangers facing children and young adults are more pressing than any fears of possible health risks from mobile phone use. It is at least conceivable that if this view were to become more widely entrenched, parents as a group might become a powerful ally of the mobile phone industry rather than a potential opponent.

The culture of distrust

- It seems probable that for a proportion of those who believe mobile phones to pose a health risk, the underlying dynamic behind their willingness to believe in a health risk is not their judgment of the scientific probabilities but their distrust of those who are telling them that there is no risk.

- Industry and government credibility problems militate against winning the rest of the public over. The sceptics won't believe the scientists, and will misinterpret any other action. The hardcore cynics are unlikely to go away.

- Suspicion of the authorities and of companies operating within the industry is by no means a phenomenon unique to the mobile phone industry, and it may be that it cannot be easily tackled. But if it must be viewed as a given factor, its implications must be understood. For example, a significant part of the public will tend to ascribe the most cynical motives to any initiative by the manufacturers or operators, even where they are in fact motivated by the best of intentions: camouflaging of masts for example, may be interpreted as an attempt to circumvent proper debate by concealing their existence from the public, rather than as a bona fide attempt to minimise their impact on the visual environment.

- Similarly, supplying health information with mobile phones, though supported by the public, may simply fuel fears rather than allaying them.

- If, as seems likely, the real root of the distrust is not in industry- or product-specific factors, there may be no industry- or product-specific solution.
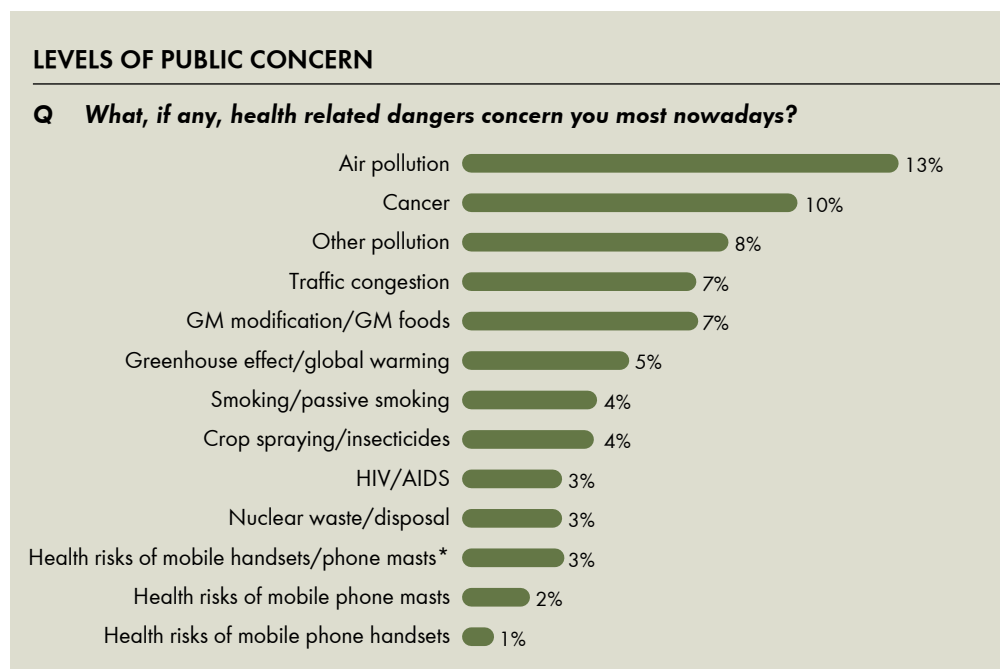
The public's perceptions

Levels of public concern

Alleged health-related dangers from mobile phone handsets or masts are a "top-of-the-mind" concern for only about one in twenty to one in thirty of the population. However, when prompted, between one in four and one in five of the public express themselves concerned about alleged health-related dangers from mobile phone handsets or masts.

The basic level of public concern about health risks from mobile phones can be measured in two ways: either by asking survey respondents to name the health issues that worry them without prompting them with suggestions, or by showing them a list of possible "health-related dangers" and asking them which of those on the list concern them most. MORI has measured the level of concern, using both methods, in a series of surveys of the British public since 1999.

The **unprompted** figure is essentially a measure of the prominence of the issue at any particular moment. A comparatively small part of the public, usually between 3% and 5%, spontaneously cite mobile phone handsets or masts when asked to name "health-related dangers" that concern them. It is clear that it is not, for most, a top-of-the mind fear or something that they spend a lot of time worrying about.

LEVELS OF PUBLIC CONCERN

Q *What, if any, health related dangers concern you most nowadays?*

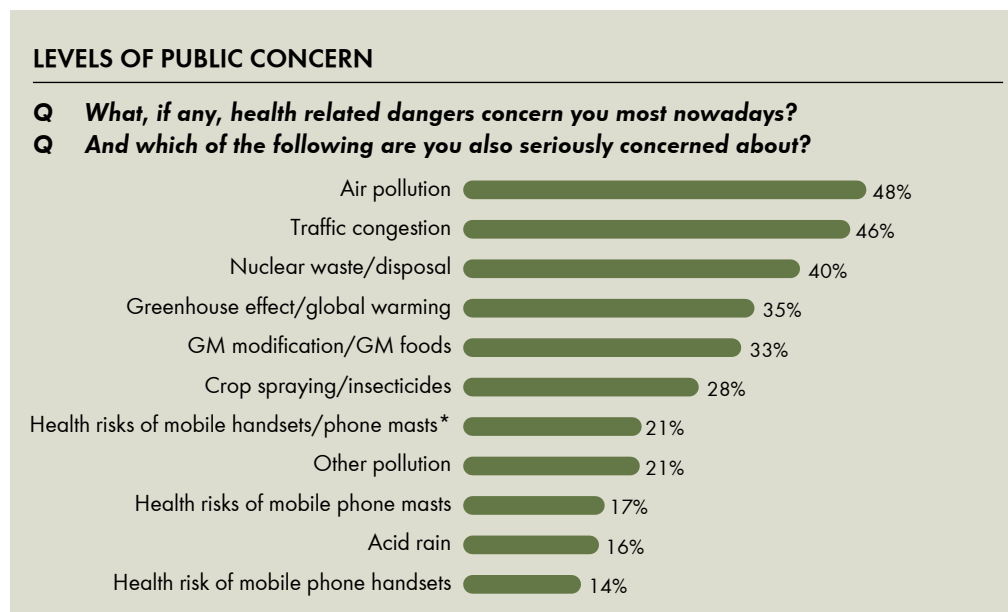|	
Air pollution	13%
Cancer	10%
Other pollution	8%
Traffic congestion	7%
GM modification/GM foods	7%
Greenhouse effect/global warming	5%
Smoking/passive smoking	4%
Crop spraying/insecticides	4%
HIV/AIDS	3%
Nuclear waste/disposal	3%
Health risks of mobile handsets/phone masts*	3%
Health risks of mobile phone masts	2%
Health risks of mobile phone handsets	1%

Base: 2,098 British Adults 15+, Oct 2003   Source: MORI

* Combined total of those who mentioned health risks from handsets, masts or both

We can compare the salience of other "health related dangers" with mentions of perceived risks from mobile phones. Four or five times as many cite their concerns about air pollution as mention mobile phones or masts, and concern about genetically-modified foods is usually higher, sometimes considerably so. (This is an issue which makes an interesting comparison since it is in some ways of similar type, in that it involves a relatively recent innovation, the facts are scientifically controversial and the public derives its knowledge of the facts and arguments almost entirely from media coverage which includes reporting the claims of campaigning groups vigorously opposed to the technology.)

LEVELS OF PUBLIC CONCERN

Q   *What, if any, health related dangers concern you most nowadays?*
Q   *And which of the following are you also seriously concerned about?*

|	
Air pollution	48%
Traffic congestion	46%
Nuclear waste/disposal	40%
Greenhouse effect/global warming	35%
GM modification/GM foods	33%
Crop spraying/insecticides	28%
Health risks of mobile handsets/phone masts*	21%
Other pollution	21%
Health risks of mobile phone masts	17%
Acid rain	16%
Health risk of mobile phone handsets	14%

Base: 2,098 British Adults 15+, Oct 2003   Source: MORI

* Combined total of those who mentioned health risks from handsets, masts or both

However, the pattern is not dissimilar for other issues of public concern, and it is instructive that although the figures in the prompted-plus-unprompted table are considerably higher than in the unprompted table, the relative ordering of issues is mostly similar. Mobile phones remain of concern to far fewer of the public than does air pollution, somewhat fewer than worry about genetic modification, but more than are concerned about acid rain. (The notable exception to this pattern is the issue of nuclear waste/disposal, ranked much higher on the prompted than unprompted table: this it seems does not immediately spring to mind as a health-related danger that causes concern, but when specifically prompted to consider it around half the public are indeed worried by it. This may be because in this case the risk is generally seen as arising only if something goes wrong, whereas in the remaining cases the circumstances in which the health risk might occur are already in place, and the only question is whether these circumstances do have health implications or not.)

There is a clear trend of diminishing belief that handsets are dangerous – the number agreeing "I do not believe that mobile phones are safe to use" has taken a broadly downwards trend and, more importantly, those disagreeing have consistently increased throughout the series of surveys. Half the public now positively disagree.

Q *How strongly do you agree or disagree with the following statement?*
I do not believe that mobile phones are safe to use.
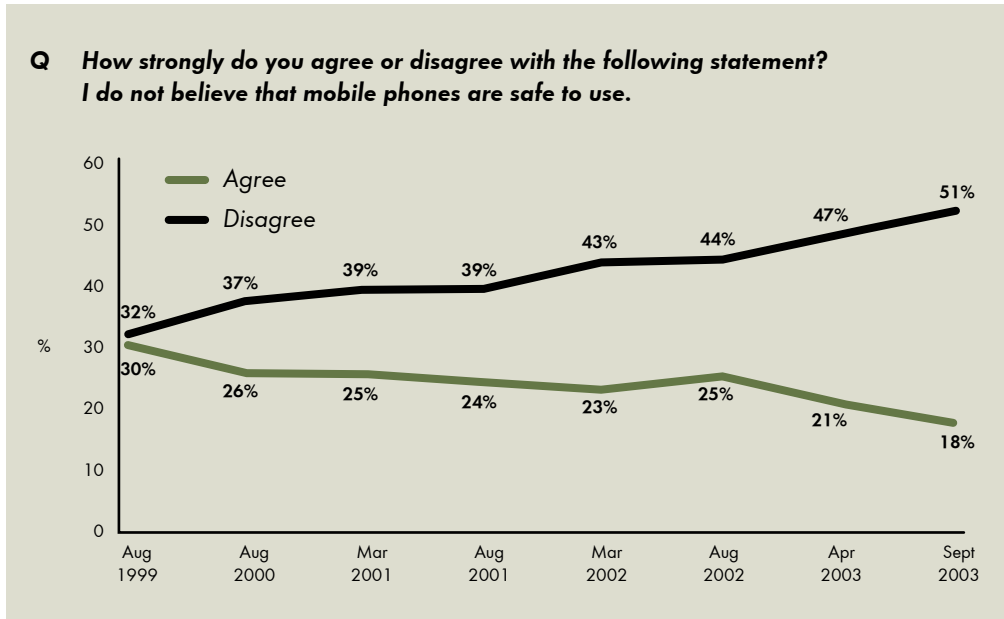
Base: All repondents (c.2,000)   Source: MORI

Yet even among those who are not prepared to go so far as to agree that mobile phones are "unsafe to use", there is a widespread awareness of a possible risk. When asked whether they associate any adverse health effects with mobile phones[1], around a half of all users say (consistently over several surveys) that they do.

Furthermore, most of those who still believe mobile phones are not safe associate their use with serious consequences – half or more believe that mobile phones cause brain cancer. (Because the group concerned are only a small sub-sample of c. 100 on each survey, wide sampling variation in the findings is of course to be expected.)

Most also believe that children are more at risk than adults – discussed below (p 23).

The fall in the number believing that mobile phone handsets are unsafe to use may well simply reflect the natural process of diminishing suspicion of new technology as it becomes more familiar, especially as increasingly widespread use has failed to produce any clear-cut cases of serious health effects which would justify the early prognostications of the critics.

It is clear that some of the public instinctively believe in possible health risks if they are unqualified to judge the issue for themselves, and others find it just as natural to dismiss all such claims without conclusive proof. Mixed messages, and a past record of poor performance by the authorities (either too cautious or too cavalier) feed this phenomenon.

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[1] Users are asked, unprompted, "Q. What problems, if any, do you associate with mobile phone use?", and all those who do not mention health risks are then specifically asked Q. "Do you associate any adverse health effects with the use of a mobile phone?". In March 2002, 35% of users spontaneously mentioned health risks, and a further 22% agreed that they did associate mobile phones with adverse health effects when asked the follow-up question.

Nevertheless, it seems reasonable to suppose that many of the public fall into a less dogmatic middle ground, suspicious of unproven innovations but prepared to allow their suspicions to be allayed by familiarity and personal benefit. If so, this would explain the speed of the fall in the belief that handsets are unsafe – few innovations have become a routine part of everyday life so quickly as mobile phones. In passing from the novel to the mundane, they have lost most of their mystery, and it is that mystery which can allow much of the scope for mistrust.
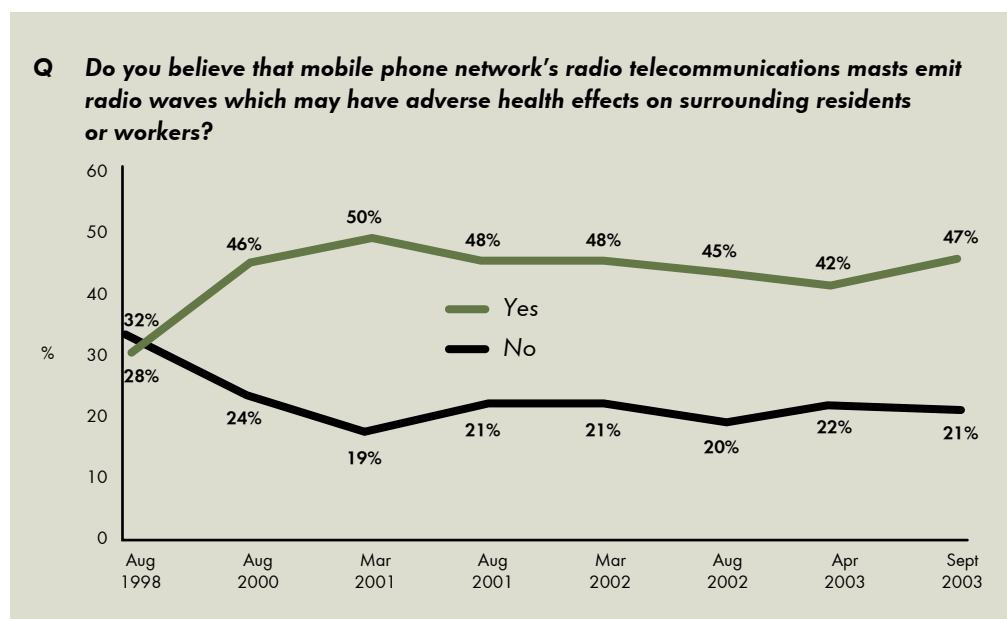
Relative concern over handsets and masts

There is little to choose between the numbers who say they are concerned about the health risks from handsets and those who say the same about masts. The two most recent surveys have found concerns about masts slightly more widespread than those about handsets, but the difference is barely statistically significant and the pattern was reversed in earlier surveys.

Nevertheless, it seems likely enough that concern about masts will become significantly the more-widespread concern of the two if the numbers believing mobile phone use to be unsafe continues to fall, since there seems to be no downward trend in the number who believe that emissions from masts might be harmful, either as measured by the "dangers that concern you" salience question already discussed, or by the more direct question on the dangers of emissions from masts.

It is at least plausible that this is because while handsets are coming to be more familiar, delivering obvious personal benefit for their users, and therefore coming to be taken for granted, masts are not. If this is the case, then camouflaging and other measures that reduce the visual impact of masts may actually be hindering their acceptance rather than easing it.
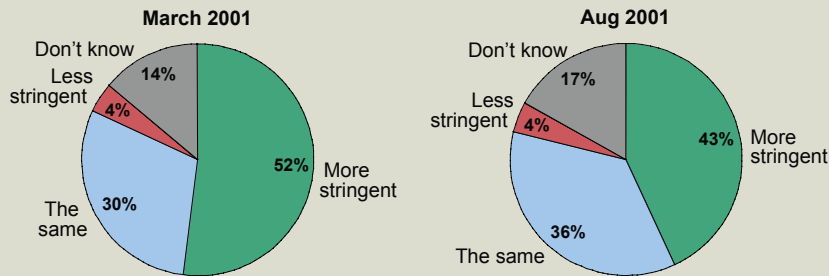
Furthermore, even though broadly similar numbers say they are "seriously concerned" about the health risks from masts and handsets, there seems to be a widespread feeling that the risk from masts is greater. More of the public believe regulations for mobile phone masts should be more stringent

Q *Do you believe that mobile phone network's radio telecommunications masts emit radio waves which may have adverse health effects on surrounding residents or workers?*

Base: All repondents (c.2,000)   Source: MORI

Q *Some people believe that mobile phones and mobile phones masts can have potential health risks. Do you think regulations for mobile phone masts should be more stringent than for mobile phone handsets, the same or less stringent?*

March 2001

Don't know **14%**
Less stringent **4%**
52% More stringent
The same **30%**

Aug 2001

Don't know **17%**
Less stringent **4%**
43% More stringent
The same **36%**

Base: All repondents (c.1,000)   Source: MORI

than for mobile phone handsets than think they should be the same (and only a tiny minority think they should be less stringent); much the most frequently cited reason for this position is a belief that masts are more dangerous.

This belief that masts pose the greater risk seems to be seen as the most important reason for posing greater restrictions on masts. The argument that, whereas users of mobile phones choose to take any risk associated with the use of handsets, any health risks from masts would affect users and non-users alike, is less frequently raised. This is a significant point.

Q: *(To those who say that regulations should be more stringent for masts than for handsets): Why do you say that?*

	Mar 2001	Aug 2001
	%	%
I think masts are more dangerous	47	50
We have no choice where masts are placed	31	27
Masts can affect children	26	22
Risks unknown/more research is needed	6	8
Because they are ugly	7	6
(Other answers below 6% omitted)		

Source: MORI/MOA

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[2] The surveys found that the proportion of the adult population owning or using a mobile phone has risen from 22% as recently as 1998, to 57% in August 2000 and to 78% in the October 2003 survey.

Effects on the public's behaviour

Handsets

Perceived health fears have little deterrent effect

A substantial proportion of those who believe mobile phones are not safe use one nonetheless. Non-users are more likely to believe that mobile phones are unsafe to use; even so in September 2003, 15% of users as well as 25% of non-users agreed "I do not believe mobile phones are safe to use."

Few of those who still resist mobile phones, it seems, do so because of health fears. There is no correlation between disliking mobile phones because of the alleged health risks and the decision whether to use a mobile phone at all; indeed, it is the one possible reason for disliking mobile phones that users and non-users share to the most equal extent.

In August 2001, when non-users were asked (in an unprompted question) why they did not use a mobile phone, 73% said it was because they didn't need one. (This figure was lower in earlier surveys, presumably the effect of those who could make use of a mobile phone increasingly acquiring them as take-up increased[2].) Only 5% cited possible adverse health effects.

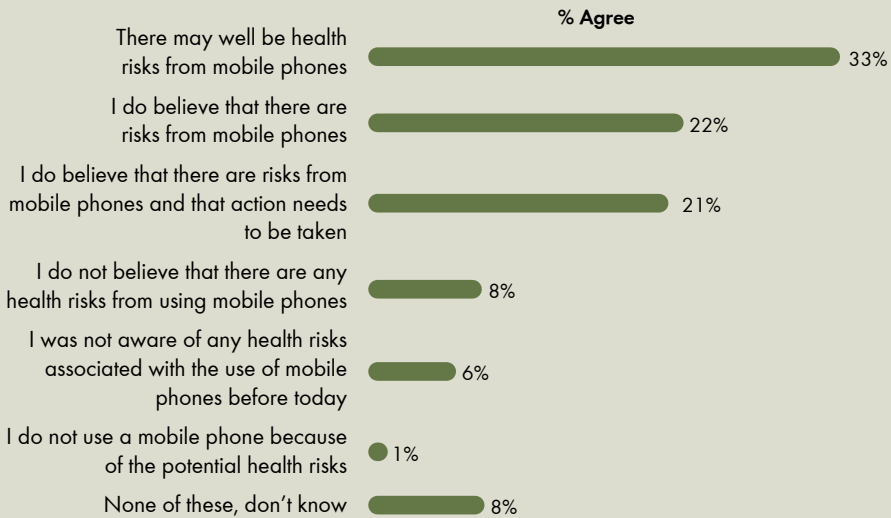**Q: *What, if anything, do you dislike about mobile phones?***

	All	Users	Non-users
	%	%	%
They're intrusive	23	22	27
Ringing in public	19	18	23
Cost of calls	13	15	6
People using them whilst driving	12	11	17
People use them unnecessarily	9	7	15
Alleged health risks	6	6	8
Cost of phone	5	6	2
They're embarrassing to use in public	4	3	6
Too many of them	4	2	8
People are too dependent	3	2	6
Children using them	3	3	5
Cost of line rental	3	3	2
Poor call quality	3	3	1
Other	1	1	1
Nothing/Don't know	27	28	26

Base: 2,046 British adults 15+   Source: MORI/MOA
September 2003

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[2] The surveys found that the proportion of the adult population owning or using a mobile phone has risen from 22% as recently as 1998, to 57% in August 2000 and to 78% in the October 2003 survey.

Q *Some people believe there may be potential health risks from using a mobile phone. Which, if any, of the following statements comes closest to your opinion?*

% Agree

There may well be health risks from mobile phones	33%
I do believe that there are risks from mobile phones	22%
I do believe that there are risks from mobile phones and that action needs to be taken	21%
I do not believe that there are any health risks from using mobile phones	8%
I was not aware of any health risks associated with the use of mobile phones before today	6%
I do not use a mobile phone because of the potential health risks	1%
None of these, don't know	8%

Base: All respondents (958), March 2001   Source: MORI


Q *How strongly do you agree or disagree with the following statement? The benefits of using a mobile phone are greater than any potential health risk.*

	% Disagree	% Agree
August 2002	21%	56%
April 2003	22%	57%
September 2003	22%	55%
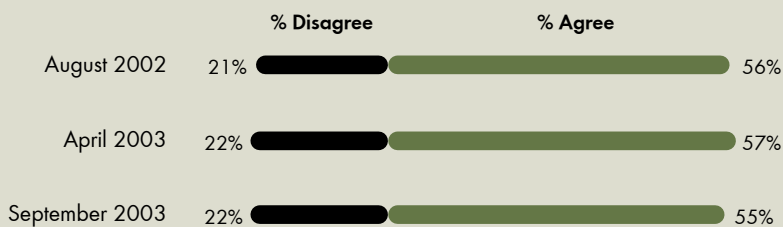
Base: All mobile phone users   Source: MORI

Q *How strongly do you agree or disagree with the following statement? Health concerns about mobile phones do not effect how much I use my phone.*

	% Disagree	% Agree
August 2002	20%	64%
April 2003	21%	64%
September 2003	20%	66%
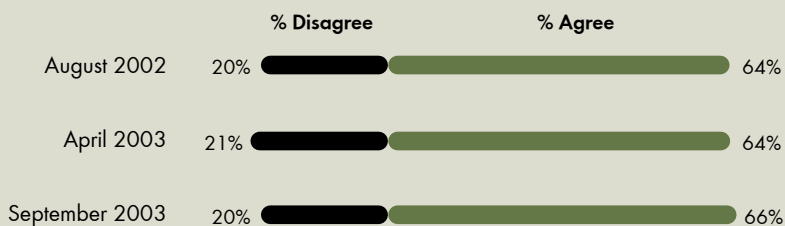
Base: All mobile phone users   Source: MORI

As with other real or potential health risks whose dangers are far more clearly established, many of those who fear that mobile phone use might involve a health risk are nevertheless not deterred from enjoying the practical benefits. More than half the public agree that it is at least possible that there may be associated health risks yet feel they must ignore them in practice. Just 1% say that the potential health risks stop them using a mobile phone altogether.

Even so, one in five mobile users disagree that "The benefits of using a mobile phone are greater than any potential health risks" and a similar proportion cannot agree that "Health concerns about mobile phones do not affect how much I use my phone", suggesting that the extent of mobile phone use might be somewhat restricted by health fears even if the number of people who use them is not.

It seems that many of those who believe in a risk ignore it in their behaviour. No doubt to some extent this results from their perception of the _degree_ of risk, to some extent conditioned by their fears being based on suspicions rather than scientifically-established fact. More than four-fifths of those users who associated health risks with mobile phone use agreed that "If medical research proved that prolonged use of a mobile phone could adversely affect my health, it would limit my use of one", and indeed half said (August 1999) that such proof would stop them using a mobile phone altogether. On the other hand, how far this should be classified with other healthy good intentions and resolutions, rather than being a genuinely accurate prediction of behaviour under such circumstances, is of course open to question. Many well-attested health risks are persistently ignored by millions of the public who are fully aware of them because they find it easier or more pleasant to do so, without anything approaching a calculation of relative risk and benefit.

It may be instructive to compare the perceived risk from use of mobile handsets with another controversial scientific issue which has received much recent media attention, the MMR vaccine. Despite the wide coverage that fears about MMR has received, it has been named by very few respondents as a "health related danger" that concerns them – even among parents only 1% mentioned MMR in the unprompted question on the October 2003 survey. Yet doctors report so sharp a fall in the uptake of the vaccine that there are genuine fears of a loss of "herd immunity" and a consequent measles epidemic. In this case, then, despite a very low "top-of-the-mind" recall of the issue a substantial proportion of the population seem to have allowed their fears on the issue to affect their behaviour. (Of course, in this case the fears concern children's health, always a magnifying factor.) Yet in the case of mobile phones, although eleven times as many people spontaneously suggest it as a health risk that concerns them, the perceived benefits of mobile phone use seem to outweigh the risks for the vast majority of the potential market.

"A necessity" – benefits outweigh risks

The benefits are only able to outweigh fear of the risks, of course, because they are seen as being considerable – indeed, three-quarters of the public now characterise mobile phones as "a necessity of modern life". Furthermore three in ten mobile phone users feel they would be lost without their phone.

Those who do not use a mobile phone themselves are, of course, less likely to agree, but even so 58% agree and only 22% disagree that mobile phones are necessary, if not to them, to modern life generally.

How strongly do you agree or disagree with the following statement?
Mobile phones seem to be a necessity of modern life.

	% Disagree	% Agree
August 2002	16%	74%
April 2003	11%	79%
September 2003	13%	78%
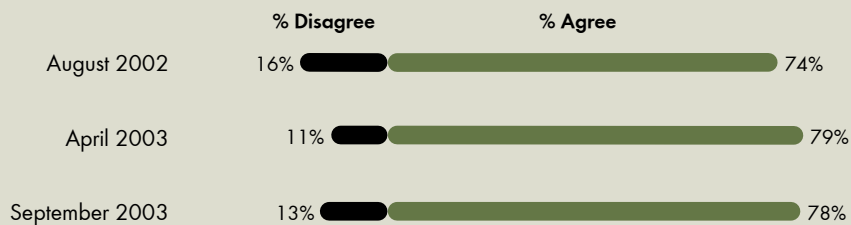
Base: All mobile phone users   Source: MORI

Nor is this attitude greatly affected by perceived risks – 73% of those who believe that mobile phones are not safe to use, and 79% of those who believe that masts emit dangerous waves, nevertheless agree that mobile phones seem a necessity of modern life.

Plainly the non-users who disagree are mostly those who do not use a mobile phone because they feel no need for one, and not those who are deterred by belief in a health risk.

It should not be forgotten, of course, that in some cases the perceived "necessity" may be not for routine use but for contact in emergencies, in which case the factors being weighed up are not health against convenience but one type of risk against another possibly more immediate one.

Indeed, the December 2003 survey showed that for over half of all mobile phone users, mobile phones give them peace of mind about others' safety (52%,) and make them personally feel safer and more secure (53%).

In the same survey, many report having used their mobile phones in emergency situations. While the most common use from a list of emergency and semi-emergency situations was to let friends or family know they will be late, mentioned by more than eight in ten, 70% have used their phone for friends and family to get in touch with them in an emergency. Other uses are wide ranging and include seeking help when their car was broken down (44% who have a one or more cars in their household), for directions when lost (37%), to seek emergency help or make a 999 call (18%), to report a dangerous situation (16%) or to seek emergency medical help (15%).

Masts

However, while health fears have not diminished the number of people using mobile phones, erection of new masts has not achieved the same passive acceptance, especially close to populated areas.

In March 2002, two-thirds of the public (65%) said that they would object to erecting a mast on a building or close to residents; objections rise to 75% if it is suggested that the mast be erected "close to children, for example on schools, hospitals or community centres".

Not only is the number who say they would welcome a new mast for its better coverage tiny, but there seems to be no correlation between this and understanding of the need for masts – those who believe a mobile phone needs a mast nearby to work properly are no more likely to welcome the increased coverage a new mast might bring than those who do not.

Q: *What would be your reaction if mobile phone operators placed a mast in your neighbourhood?*

Q: *What would be your reaction if mobile phone operators placed disguised or camouflaged masts in your neighbourhood?*

	Apr 2003		Sep 2003	
	Mast	Camou-flaged	Mast	Camou-flaged
	%	%	%	%
I would object about this	35	35	42	41
I would want more information	14	12	13	12
I'd be suspicious	10	16	9	14
I would want to move	2	2	4	3
I would welcome it for better coverage	2	3	3	2
No reaction/indifference	31	30	27	27

Source: MORI/MOA

Camouflage

It will be seen in each survey that while promising to camouflage the mast causes no significant reduction in the number who say they would object, it increases by half the number who say they would be suspicious.

> *"No I wouldn't like [a mast to be camouflaged], I think that's underhand to actually do that without saying it is here. To me that is saying there is something wrong with this and they are hiding it."*
>
> *Female focus group member, 2001*

Clearly, the main objection to the erection of masts is not their impact on the visual environment. But, further, it may be that the idea of camouflaging is in fact counter-productive, and is taken as being aimed not at minimising the visual environmental impact but in allowing masts to be erected covertly without the knowledge of residents. There seems to be an inherent suspicion of the operators and their motives (and particularly of their commitment to public health and safety).

Understanding the need for masts

One reason why acceptance of the "necessity" of mobile phones has not been matched by acceptability of masts is that the need for masts to operate an effective network seems to be surprisingly little understood.

Although understanding is unsurprisingly higher among users than among non-users (in September 2003, 43% of users and 33% of non-users agreed with the statement), it should be noted that even of those who use mobile phones less than half agree, while of those who express an opinion either way non-users are in fact *more* likely to agree than users.

But, of course, the acceptability of masts must leap an extra hurdle in that if there were any health effects the masts would pose a risk to users and non-users alike. Since non-users would have nothing to gain from the maintenance of a viable network (and seeing no need to have a mobile phone seems to be the principal reason for not using one), any possible health risks will not be offset by obvious advantages.
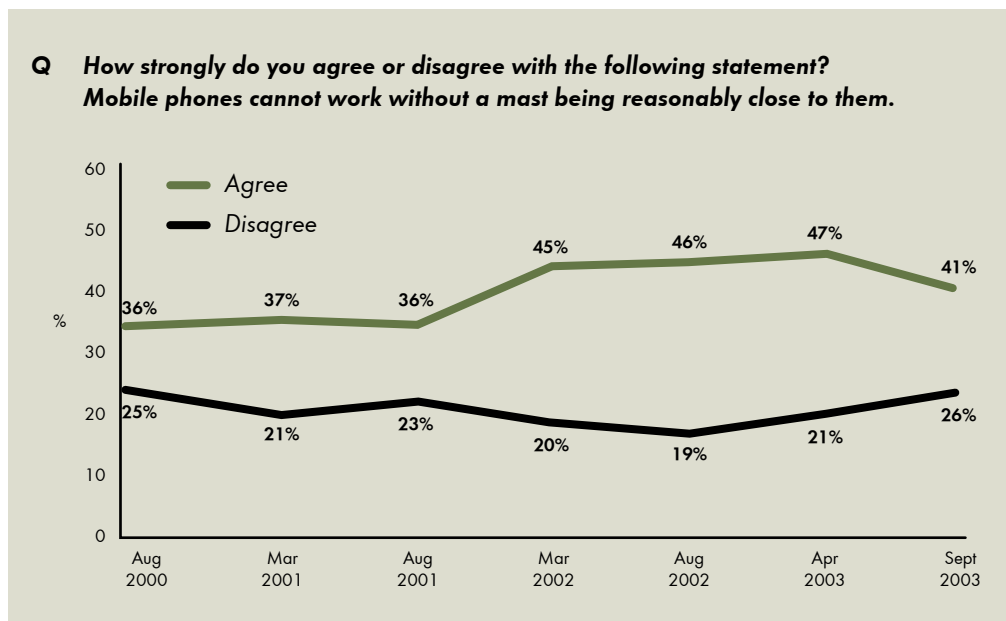
Base: All repondents   Source: MORI

Further, while it is true that even many of those who do not use a mobile phone themselves accept that they have become a necessity for others, they will tend nevertheless to be less interested in how mobile phones work. Half of those who do not use mobile phones have no opinion whether mobiles can operate away from masts or not; it seems they take little interest in a question they do not see as affecting them, and hence it seems quite likely that they might simply ignore any attempts at public information on the matter – they are not a receptive audience to being convinced of the need for masts.

Sources and causes of health fears

Changes over time and media effects

Levels of concern about health risks of all sorts vary to some degree over time, and this variation often takes the form of fluctuation rather than a consistent trend in opinion. This shows through clearly in the unprompted "health concern" figures. This is as would be expected – most of the public probably only hold a limited number of fears or concerns at the "top-of-the-mind" at any one time, and these will be liable to be displaced by new or more urgent concerns, or by new reminders or reinforcements of existing fears, while having less effect on their underlying convictions.

It seems inevitable that part, at least, of this variation is related to media coverage and news events. The clearest example, perhaps (not shown on the table), is that unprompted concern about "animal health (BSE, Foot and Mouth)" reached 4% in March 2001, at the height of media coverage of the Foot and Mouth Disease epidemic, but has faded away to nothing in subsequent surveys. (It is, perhaps, worth noting that Foot and Mouth Disease, the media coverage of which presumably caused this jump in public concern, is not thought by scientists to pose any threat to human health.)

Nevertheless, it is noteworthy that, judged over the whole period since 1998, the surveys have found more variation in unprompted concern about health risks from mobile phones than any

Q: What, if any, health related dangers concern you most nowadays? (unprompted)

	Aug 1999	Aug 2000	Jan 2001	Mar 2001	Aug 2001	Mar 2002	Aug 2002	Apr 2003	Sep 2003	Oct 2003
	%	%	%	%	%	%	%	%	%	%
Air pollution	19	24	20	14	20	19	16	14	17	13
Other pollution	11	16	14	8	12	n/a	10	7	11	8
Cancer	10	8	10	12	8	9	10	9	6	10
Traffic congestion	9	12	8	6	10	8	8	8	8	7
GM modification/GM foods	11	10	9	7	9	4	6	4	8	7
Greenhouse effect/ global warming	4	8	10	7	8	4	6	4	6	5
Nuclear waste/ disposal	4	7	4	5	5	4	5	3	5	3
Smoking/passive smoking	6	6	4	4	4	3	3	5	5	4
Crop spraying/insecticides	4	5	4	4	5	5	4	3	5	4
Health risks of mobile handsets/phone masts	**1**	**5**	**4**	**3**	**7**	**3**	**2**	**5**	**5**	**3**
*Health risk of mobile phone handsets**	*n/a*	*n/a*	*n/a*	*n/a*	5	2	2	3	3	1
*Health risk of mobile phone masts**	*n/a*	*n/a*	*n/a*	*n/a*	3	2	2	3	3	2
Acid rain	1	1	1	2	2	1	2	1	1	1

(Others below 1% or not recorded in all surveys omitted)

*Not separately measured before August 2001   Source: MORI/MOA

of the other ten concerns in the list.[3] It is clear that this variation does not represent a consistent trend. By far the lowest figure is the first, from the 1998 survey, suggesting a sudden increase in awareness of the alleged risks between 1998 and 1999, since 1999 the variations in unprompted mentions of danger from mobile phones seem haphazard, and are certainly much bigger than can be explained purely by sampling error. It seems highly probable that what is being measured is real variation in the public's "top-of-the-mind" awareness of the issue, quite likely because external factors have made it more a matter of public debate or consciousness at the time of some surveys than of others.

Variations in media coverage seem the most obvious possible cause of this; and if this is the case it seems that media coverage has had more effect on the salience of the mobile phone issue than of the other possible health risks. The "agenda setting" power of the media is well-established, having been

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[3] The degree of variation in a time series can be judged crudely by comparing its highest and lowest points, or in a more sophisticated way by measuring its standard deviation. The co-efficient of variation (the standard deviation divided by the mean) for mobile phones is 0.46. The next highest is 0.37, for acid rain, while the least variable measure is that for crop spraying/insecticides, with a co-efficient of only 0.16. As an alternative measure of the same variation, the highest figure for risk from mobile phones is 7 times as big as the lowest; the next highest ratio is 2.75, for GM foods, while for crop spraying, the least variable, the ratio is only 1.67. Although mentions of air pollution vary in an 11-point range from a minimum of 13% to a maximum of 24%, this is a far lower variation proportionally than the variation in concern about mobile phones.

the focus of considerable academic research.[4] Although this research has concentrated mainly on "political" issues, it has clearly shown that in Britain, as elsewhere, responses to an unprompted salience question (e.g. most important issues facing the country) can be closely correlated with the weight of media coverage of certain topics. Members of the public who believe that there may be a health risk from using mobile phones overwhelmingly cite the media as their main source of information:

Q: *Why do you say [that mobile phones are unsafe to use because of the health risks]?*

Q: *And which, if any, of the following reasons explain why you say mobile phones are unsafe to use because of the health risks?*

(Combined prompted-plus-unprompted)

	Aug 2002	Apr 2003	Sep 2003
	%	%	%
I have seen stories on the TV	67	66	62
I have read stories in national newspapers	56	54	48
I have read stories in local newspapers	22	27	28
I have heard stories on the radio	30	17	24
Friends or family have told me	10	8	12
Friends/family have suffered health effects	6	5	8
Teachers at school have told me	1	1	5
I have suffered health effects personally	5	3	4
Information sent to my house	5	5	3
Other	2	5	5
Don't know	2	5	3

Base: All who agree mobile phones are not safe to use because of the health risks   Source: MORI/MOA

Moderator: Papers, do you believe them?

Man: No.

Woman: No.

Woman: You take it in, don't you, so you have it stored, but you just carry on.

Focus group, 2001

Among this group, readers of tabloids are a little more likely than broadsheet readers to say they got their information from national newspapers; as this does not seem to be a class effect[5] it seems likely that this difference may indeed be caused by differences in the coverage of the issue between broadsheet and tabloid nationals.

However, as on almost every subject, television is the single most pervasive information source and its dominance is probably understated by this measure of mere reach, if only because the public tends to be less trusting of the press

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[4] The term was coined in reference to the USA in Maxwell McCombs & Donald Shaw, 'The agenda-setting function of the mass media', Public Opinion Quarterly 36 (1972), pp 176-87. Significant recent research in the field includes Stuart Soroka, Agenda-Setting Dynamics in Canada (University of British Columbia Press, 2002). Similar research in Britain has included Colin Lacey and David Longman, The Press as Public Educator: Cultures of Understanding, Cultures of Ignorance (University of Luton Press, 1997) which demonstrated a clear link between mentions of the environment as one of the "most important issues facing Britain" in unprompted surveys and the levels of press coverage of the issue.

[5] There is, of course, a strong class element to readership patterns.

Q: *What, if any, health related dangers concern you most nowadays?*
Q: *And which of the following are you also seriously concerned about?*

(Prompted plus unprompted)

	Mar 2001	Aug 2001	Mar 2002	Aug 2002	Apr 2003	Sep 2003	Oct 2003
	%	%	%	%	%	%	%
Air pollution	52	59	52	53	50	54	48
Traffic congestion	43	48	47	46	46	48	46
Nuclear waste/ disposal	53	51	43	46	41	47	40
Greenhouse effect/global warming	45	48	38	42	35	40	35
GM modification/GM foods	39	38	30	31	30	35	33
Crop spraying/use of insecticides	34	34	30	28	28	31	28
Health risks of mobile handsets/phone masts	26	28	24	21	25	24	21
*Health risks of mobile phone handsets**	n/a	22	19	17	19	17	14
*Health risks of mobile phone masts**	n/a	18	15	14	17	19	17
Other pollution	19	27	n/a	20	20	26	21
Acid rain	23	22	18	17	17	17	16

Base: All who agree mobile phones are not safe to use because of the health risks

than of television – though it can still be pervasive. Many take the views expressed in one of our focus groups.

In February 2003, only 18% of the public said they would trust journalists to tell the truth, and 75% would not trust them to do so.[6] But while the public claim considerable scepticism about what they are told by the media, especially newspapers, they also regard them as a vital and irreplaceable source of information, and their theoretical scepticism may not prevent some of them from absorbing the media message in practice, especially if it is frequently repeated. The "no smoke without fire" instinct seems to be a strong one.

An important limitation to the short-term effect of media coverage, though, is that underlying attitudes seem to be much more stable than top-of-the-mind concerns. The variations in the combined prompted-plus-unprompted salience figures are very much less than in the unprompted figures alone; nor, in this case, do perceptions of mobile phone risks stand out as being more variable than most of the other possible health risks tested. [7]

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[6] MORI survey for the British Medical Association (BMA).

[7] The lowest coefficients of variation are for traffic congestion (0.04) and air pollution (0.07); but there is little to choose between the variation in mobile phones (0.11), nuclear waste/disposal (0.11), GM foods (0.11) and greenhouse effect/global warming (0.12). Concern about acid rain and "other pollution" were a little more variable (0.15 in each case).

There is little evidence here that the real level of underlying concern is much subject to immediate media influence or other short-term effects; indeed, the movement is little greater than would be expected through normal sampling variation. Hostile but inconclusive media coverage probably increases the importance of the issue to those who are worried about it anyway, but perhaps has less effect on the opinions of those not already convinced that the risk is real. It seems clear that while some of the public react to the unproven possibility of a health risk with immediate caution, others take precisely the opposite view, considering that the whole issue is no more than scare-mongering, and that nothing short of conclusive proof of health effects would make them take the possibility seriously.

But it is clear that the level of "top-of-the-mind" concern is much more volatile and liable to be blown by the winds of short-term circumstance. Since it is this level that is likely to be more closely predictive of levels of public agitation or protest, it should be obvious that the tone and content of media coverage can inevitably have a very real impact.

Solid and convincing scientific evidence in either direction, of course, might be expected to change the situation. For the greater part of the public, it is probable that they will continue to keep an open mind until they are presented with proof that convinces them one way or the other. Precisely what proof would be required to rid the public of any nagging doubts about the safety of mobile phones is unclear; however, qualitative research suggests most would like large-scale, longitudinal, international studies, conducted independently, peer-reviewed and endorsed by multiple agencies. Even this will by no means satisfy everybody, but it would be enough for many; and, perhaps as important, it might modify the tone of some media reporting.

However (as the table, p. 40, in the Appendix shows) levels of public concern about risks often show scant regard for the scientific estimates of the real degree of risk involved.

Effect of mast protests

In addition to underlying levels of concern, it is plain that protests against masts in an area are effective in influencing the local population against them, at least temporarily – 66% of residents believe emissions may have adverse health effects in areas where respondents are aware of there having been a protest, against 46% where there has been no protest or respondents have not been aware of it.[8] This is perhaps unsurprising, though it is a reminder that many of the public are receptive to the message that the protestors are putting across.

Fear may be generalised, not specific

There is considerable overlap between those who fear masts and those who fear handsets, the majority of those who say they are concerned about the risk from handsets also being concerned about the risk from masts, and vice-versa. Similarly, there is a clear correlation between belief that handsets are dangerous and belief that masts emit waves that "may" be dangerous. In April 2003, those who said they believed mobile phones were not safe to use were more than half as

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[8] The difference is too big to be plausibly explained by the alternative suggestion that it is higher belief in the dangers of masts in these areas that causes the protests in the first place, though this cannot perhaps be entirely ruled out as a contributory factor.

likely again to believe that masts may cause adverse health effects as those who did not. Since the supposed risks are of a broadly similar type and cause, this correlation is unsurprising, but it may also reflect a degree of mistrust in the industry and in government health regulations which is not directly dependent on any rational assessment of scientific evidence.
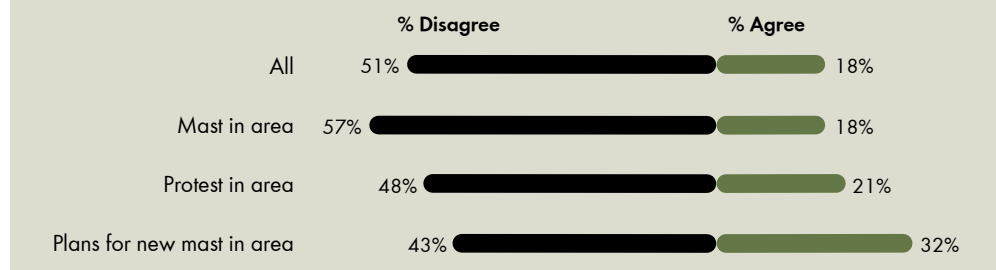
Q: *Do you believe that mobile phone network's radio telecommunications masts emit radio waves which may have adverse health effects on surrounding residents or workers?*

	All	Phones "safe to use"	Phones "not safe to use"
	%	%	%
Yes	47	43	68
No	21	26	16

Base: 1,885 British adults 15+
September 2003

This is further supported by the finding that a local protest about masts apparently propagates fears about *handset* use: in areas where respondents are aware of future plans for a new mast (and by implication where protests are most likely to be active at the time of the survey), the public is much more likely to believe that using a mobile phone is dangerous.

Q *How strongly do you agree or disagree with the following statement?*
I do not believe mobile phones are safe to use.

	% Disagree		% Agree
All	51%		18%
Mast in area	57%		18%
Protest in area	48%		21%
Plans for new mast in area	43%		32%

Base: All respondents, 2,046, mast in area, 505, protest in area, 187, plans 64, Sept 2003   Source: MORI

This can only indicate that the protests and publicity that surround the erection of new masts, and perhaps even local reporting and/or debate on decisions to site masts without formal protest, do more than merely cause the public expression of existing concerns. At the very least, they raise latent fears into real ones. But they also go beyond the issue of masts, cross-fertilising also into fears about handsets, so that those living in areas where a new mast is a matter of public controversy are half as likely again as the rest of the public to believe handsets are unsafe. This is presumably a consequence of the protests raising wider issues than simply the siting of a single mast, especially protestors stirring up distrust of the operators and regulators.

It is also important to note, however, that this phenomenon seems to wear off quickly – distrust of handsets in areas where there have been protests in the past is little higher than in the rest of the country.
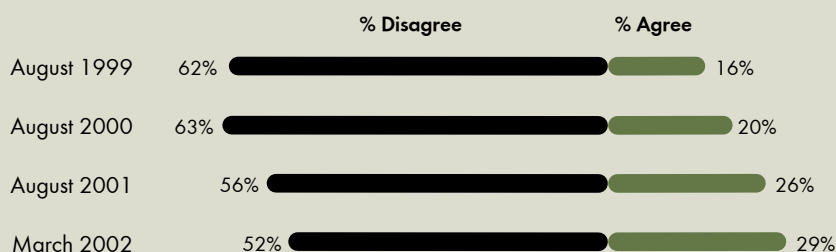
Children and mobile phones

As on many other issues, the public is more protective of children than of adults in considering the alleged risks from mobile phones. This is exacerbated by a widespread belief (among parents and non-parents alike) that children are more vulnerable to the potential dangers, especially among those who believe in any case that mobile phones are harmful. (In Britain this was no doubt reinforced by the Stewart Report[9], which pointed to the same belief, and urged a precautionary approach.) Given these two factors, it is almost inevitable that health-related opposition to mobile phones will concentrate particularly on the risk to children.

	All	**Mobile phones "safe to use"**	**Mobile phones "not safe to use"**	**Children household**	**No children in household**
	%	%	%	%	%
Agree	43	34	70	41	44
Disagree	16	25	7	20	14

Q: *How strongly do you agree or disagree with the following statement. Mobile phones cause more harm to children than they do adults.*

Base: 1,885 British adults 15+
September 2003

Q *How strongly do you agree or disagree with the following statement? Mobile phones should continue to be available for children to use.*

	% Disagree	% Agree
August 1999	62%	16%
August 2000	63%	20%
August 2001	56%	26%
March 2002	52%	29%

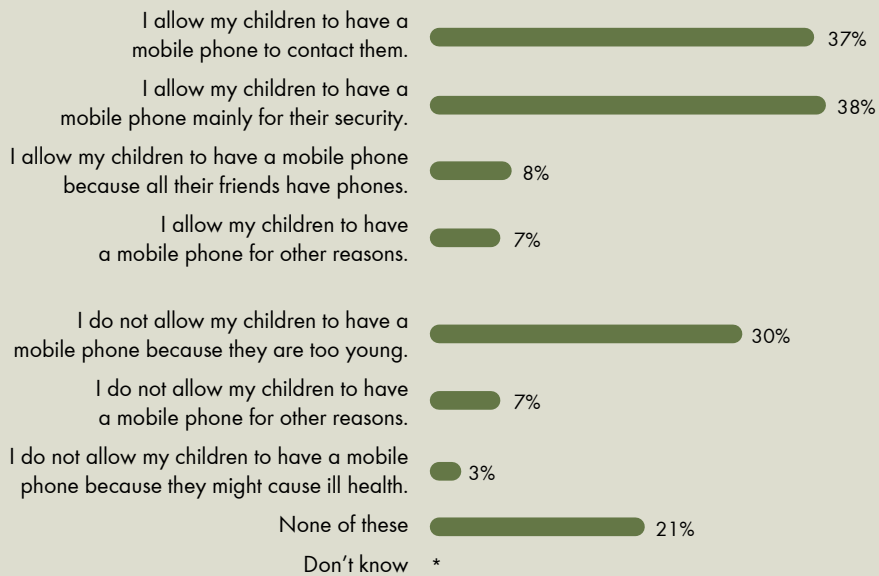Base: All respondents   Source: MORI

Partly as a consequence, the very use of mobile phones by children is unpopular. In fact, a majority of the public seem to favour an outright ban on children having mobile phones, although the number taking this line has been in decline.

But it should be borne in mind that factors other than health concerns probably play their part in driving this attitude. In March 2002, even of those who said they believe mobile phones are safe to use a plurality (45% to 40%) disagreed that they should continue to be available to children. These views may arise from a feeling that there is a wider social harm to children from using mobile phones, perhaps by increasing their vulnerability to crime or by affecting their educational and social development. It may also arise from a feeling that children's use of mobiles causes

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9   Report of the Independent Expert Group on Mobile Phones ("Stewart Report"), May 2000, available at
    http://www.iegmp.org.uk.

I allow my children to have a mobile phone to contact them.	37%
I allow my children to have a mobile phone mainly for their security.	38%
I allow my children to have a mobile phone because all their friends have phones.	8%
I allow my children to have a mobile phone for other reasons.	7%
I do not allow my children to have a mobile phone because they are too young.	30%
I do not allow my children to have a mobile phone for other reasons.	7%
I do not allow my children to have a mobile phone because they might cause ill health.	3%
None of these	21%
Don't know	*

Base: All parents of a child/children under 16 who lives with respondent (587), Dec 2003   Source: MORI

"I don't know, there are so many other things out there that really could hurt him, and I think of the risk of him being out and getting into trouble and not being able to ring help. You walk down the street and you see these phone boxes and a lot of them don't work. So for my peace of mind I would rather he had one."

Male parent, focus group, 2001

unnecessary nuisance to others – presumably non-users of mobile phones can be expected to be least tolerant of their use by others, and it may be relevant that non-users were three-to-one against continuing to allow children to use mobile phones.

It is worth noting that in December 2003 only 3% of parents (with a child under 16 living with them) do not allow their children to use mobile phones because they think mobiles may cause ill health. The most common reason parents do not allow their children to have phones is because they are too young (30%).

In comparison nearly four in ten parents say they let their children have mobile phones so that they can be in contact at any time (38%), or mainly for security reasons (37%).

Many parents may feel any possible health risks of handset use are outweighed by the potential safety advantages of being constantly in contact in emergencies:

The culture of distrust

Suspicion of government, industry and scientists

It seems probable that, for a proportion of those who believe mobile phones to pose a health risk, the underlying dynamic behind their willingness to believe in a health risk is not their judgment of the scientific probabilities but their distrust of those who are telling them that there is no risk.

Other surveys on a wide variety of topics suggest a widely-held perception of a division between "them" and "us", in which both government and large private-sector companies of whatever type are regarded as "them". This seems in particular to colour attitudes to possible health risks, with a belief that government and manufacturers would be likely to collude to conceal risks to the public.

The existence of this perception seems to be independent of the type of risk in question and of the strength of evidence for or against a health risk.

Distrust of the companies was revealed in the March 2001 survey, when the public disagreed almost two-to-one (42% to 23%) that "Mobile phone operators are being honest when they say that using a mobile phone is safe"; indeed, even of those who said they personally thought that mobile phones were safe to use, 29% thought that the operators were not being honest when they said so and only 38% that they were. The vast majority of those who believe mobile phones to be unsafe also deny that the operators are being honest in their denial of a risk. Similarly, only 24% in March 2001 and 18% in August-September 2000 agreed that "The mobile phone industry openly shares all available scientific research", while 44% and 46% respectively disagreed.

As revealed in many surveys on other subjects, government and the business community are likewise distrusted, and scientists are viewed as suspect if their sponsors or employers are seen to have a vested interest in their findings – thus scientists working for environmental groups tend to be more trusted than those working for the government or in industry. At the other end of the scale, trust in doctors tends to be almost absolute (notwithstanding occasional medical scandals which have received wide media coverage). In August 1999, respondents were asked which they felt to be the "most trustworthy source of information regarding health concerns": 57% chose doctors, and 23% scientists, while only 4% trusted government agencies and 1% mobile phone manufacturers. In June 2003, in a separate survey not related to mobile phone use, 55% of the public said they would trust doctors "a great deal" to give them good advice, while only 8% would trust government scientists to the same degree; worse, while 91% trusted doctors at least "a fair amount", only 45% trusted government scientists that much, fewer than the 47% who trusted The Internet.[10]
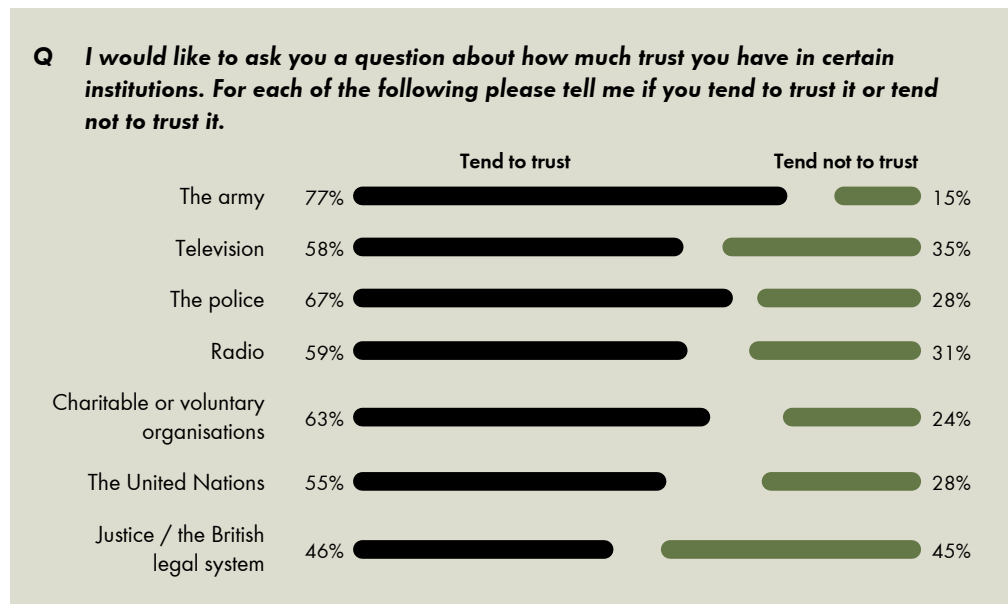
In the same survey, only 11% of the public agreed that "Directors of large companies can be trusted to tell the truth". Indeed, in general terms, "big business" is one of the least trusted institutions in British society, and although the public claims to distrust the press even more, the broadcasting media find a far more sympathetic audience. The mobile phone industry is certainly not alone in having a credibility problem with the public.

A MORI survey for the University of East Anglia[11] under a grant from the Economic and Social Research Council (ESRC)'s Science and Society Programme in July 2002 explored public attitudes to science and scientists, and the information sources received by the public, and selected five topical and controversial issues to use as case studies – climate change, genetic testing for inherited diseases or disorders, genetically modified food, radiation from mobile phone handsets, and radioactive waste – testing how each related to the public's trust in government and its regulatory role. Overall reaction to the issues ranged from the 53% who found genetic testing acceptable to only 14% saying that radioactive waste was acceptable.

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[10] MORI survey for the Financial Times, published 30 June-1 July 2003.

[11] MORI interviewed a representative sample of 1,547 adults aged 15+, with sub-samples of approximately 300 used for the detailed questions about each of the five risk cases.
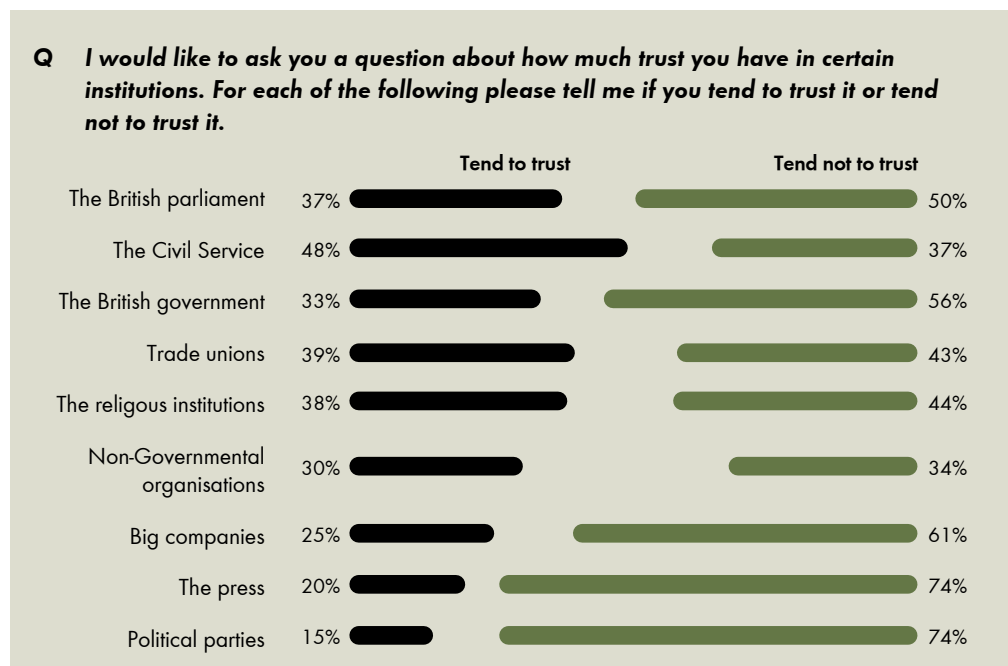
The table below shows public agreement with four of the key statements which were applied with reference to each of the five issues. It is obvious at a glance that distrust in the government on all these issues is deep – the public believes the government distorts the facts, does not act in the public interest, does not listen to what ordinary people think, and does not provide the public with all relevant information. But what is more striking, despite the differences between the five issues in both circumstances and implications, is that the findings on each issue are extraordinarily similar.

Q *I would like to ask you a question about how much trust you have in certain institutions. For each of the following please tell me if you tend to trust it or tend not to trust it.*

	Tend to trust	Tend not to trust
The army	77%	15%
Television	58%	35%
The police	67%	28%
Radio	59%	31%
Charitable or voluntary organisations	63%	24%
The United Nations	55%	28%
Justice / the British legal system	46%	45%

Base: 1,311 United Kingdom adults, 30 March-24 April 2002   Source: MORI

It seems clear from this research that public distrust of the government's regulatory role is not directly related to the issue in question, but is principally a reaction to government *per se*. It is distrusted equally to regulate on risks that the public want to be taken and those which they do not.

Q *I would like to ask you a question about how much trust you have in certain institutions. For each of the following please tell me if you tend to trust it or tend not to trust it.*

	Tend to trust	Tend not to trust
The British parliament	37%	50%
The Civil Service	48%	37%
The British government	33%	56%
Trade unions	39%	43%
The religous institutions	38%	44%
Non-Governmental organisations	30%	34%
Big companies	25%	61%
The press	20%	74%
Political parties	15%	74%

Base: 1,311 United Kingdom adults, 30 March-24 April 2002   Source: MORI

Government has clearly lost some credibility through its record on previous health issues, such as BSE, but the problem is much deeper than this – the assumption of many seems to be not simply that government is too incompetent for its assurances to carry credibility, but that it is untrustworthy and acts in a "government interest" which is at odds with the public interest. The very substantial revenues to the public purse generated by the auction of 3G licences can only have fuelled this scepticism by demonstrating a clear government vested interest in the success of the industry.

Q: **To what extent do you agree or disagree with the following statements?**
a. The government distorts facts in its favour regarding...
b. The government is acting in the public interest with regard to...
c. The government listens to what ordinary people think about...
d. The government provides all relevant information about...to the public.

	a	b	c	d
Net (agree minus disagree)				
About...	%	%	%	%
Climate change	+46	-20	-48	-55
Genetic testing	+37	-9	-39	-58
Genetically modified food	+44	-13	-40	-50
Radiation from mobile phone handsets	+29	-17	-32	-50
Radioactive waste	+50	-18	-43	-60

Base: 1,547 adults, 6-31 July 2002, with a split-sample
(each of the issues being put to a fifth of the sample)

Source: MORI/University of East Anglia

Similarly, many of the public tend to be sceptical of the independence of scientific research, especially where the funding is by a body with a vested interest. In the MORI/UEA survey, 60% agreed and only 6% disagreed that "The independence of scientists is often put at risk by the interest of their funders".

"It depends who's pulling the strings doesn't it.... Where money is involved, there is bound to be some string pulling."

Focus group, 2001

Clearly, a significant part of the public find no difficulty in believing that, even were scientists to discover that mobile phone use were lethally dangerous, such a finding could be and would be suppressed, and that consequently they have no basis beyond their own instincts for judging whether mobile phones are safe or not.
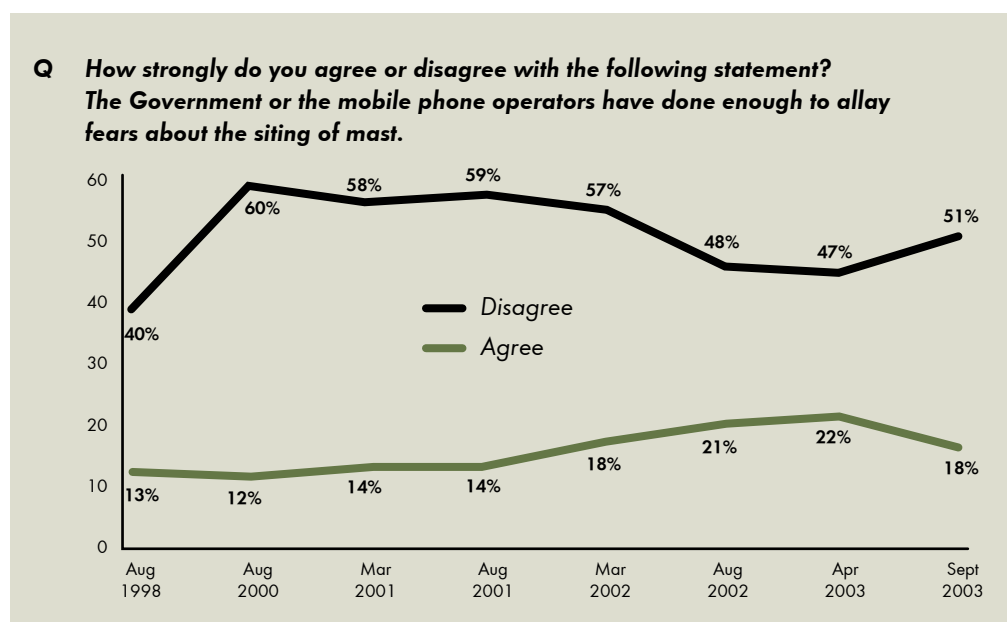
Consequences of distrust

The breadth of this distrust is an obvious obstacle to any concerted attempt to reduce public fears about mobile phones. While the hard core who are implacably convinced of the corruption of companies, government and scientific community alike is presumably a small one, the number who at least have an instinctive tendency towards such distrust seems much greater. This group will tend to disregard the assurances of the operators and manufacturers, but will be unconvinced too by any weight of scientific evidence (unless it emanates from the anti-establishment sources that they trust more instinctively), and official government statements may even be counter-productive.[12]

If there wasn't anything wrong with them why don't they put them on the high roads?

Male focus group member, 2001

For example, few of the public feel either the government or the operators have done enough to allay health fears about mast siting [13].

The automatic presumption that the motives of the companies must always be suspect also means that every action will be interpreted by some of the public in its worst possible light. Cautious siting of masts away from buildings where possible will be taken as confirmation that they are dangerous.

> **Q** *How strongly do you agree or disagree with the following statement?*
> *The Government or the mobile phone operators have done enough to allay fears about the siting of mast.*

Base: All repondents   Source: MORI

As already noted (p. 21), camouflaging of masts to reduce their visual impact will be seen as intended to avert proper scrutiny by allowing them to be erected secretly.
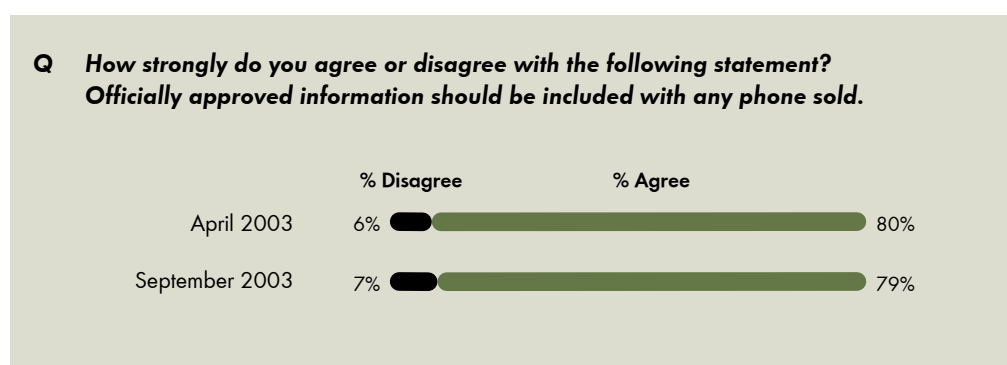
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[12] Nevertheless, this distrust can cut both ways. One focus group member suggested that health concerns about mobile phones might be deliberately exaggerated by companies owning landline telephone networks, whose profits were at risk through increasing use of mobile phones!

[13] Although since the start of 2002 the trend shows a consistently – though only slightly - higher level of confidence than was previously the case.

Of course, these extreme cynics are at worst a minority of the public, probably a small fraction, but they include the industry's most vocal opponents. Action which may well be effective in reassuring or appeasing the less committed, neutral mass of the population will have the opposite effect with the more credulous minority. But this is not in any way unique to the mobile phone industry, nor indeed has much real connection with mobile phones or masts as such except in that they involve recent scientific innovation. When quarter of the public agree that "Science seems to be out of control" and 40% that "We put too much trust in science", there is always going to be a minority that will not give any scientific issue a fair hearing, especially if their other prejudices point them in the opposite direction.

Health information

Most of the public agree that "Officially approved information should be included with any phone sold".

Q *How strongly do you agree or disagree with the following statement?*
Officially approved information should be included with any phone sold.

	% Disagree	% Agree
April 2003	6%	80%
September 2003	7%	79%

Base: All repondents

These findings may not be evidence of any widespread demand for such documentation; the public will rarely oppose a proposal that more information on any subject should be made available, and it would be more surprising if this suggestion had not found wide support. However, they do suggest that the public would be supportive of such initiatives and, perhaps more relevantly, is receptive to criticism from the industry's opponents if such measures are not taken, making an easy target for those who wish to attack the manufacturers and operators. On the other hand, other evidence suggests that many of the public will tend to take any "official" information with a pinch of salt, their distrust of government being just as pervasive as their distrust of industry, and it may therefore have little positive effect.

Conclusions
and Implications

Most of the public do not believe that mobile phones are unsafe, and the number that do is diminishing, and there seems every reason to suppose that it will fall further as the technology loses its novelty and becomes more familiar as a part of everyday life. Nevertheless, a significant minority believe that there is a risk from mobile phone handsets, and that there is a more dangerous risk from masts. The intensity of their concern is exacerbated by the belief that children are most at risk.

But there seems every reason to believe that many of the problems that the mobile phone industry faces from a belief that mobile phones or masts pose a health risk neither arise from industry-specific causes nor are likely to be susceptible to industry-specific solutions.

Scientific innovation of any sort implies some degree of uncertainty, and a public that is not scientifically-minded will make little allowance for the impossibility of proving a negative, and will take any necessary caution in a scientist's denial of risk as equivocation. But the recent apparent examples of risk denied and then shown to be real[14] naturally drive the public towards greater suspicion, as well as inclining scientists toward greater caution in drawing conclusions. Since many of the public also distrust government and any company with the temerity to make a profit, they are thrown back upon their interpretation of the information they receive through the media, especially television. But "news values" and the requirement of "balance" alike ensure that the lone heretic is always assured of a broadcast hearing, and many of a public not qualified to judge between arguments on their scientific merits will take the side of the rebel precisely because the scientific establishment opposes him. The situation is a vicious circle in which any real benefits or dangers of mobile phones are essentially an irrelevance.

In other words, some of the public will inevitably believe that mobile phones are dangerous, and there is probably nothing that can be done in the short term that will change their minds. As for the remainder, their expectations are high. Qualitative research suggests they would like large-scale, longitudinal, international studies, conducted independently, peer-reviewed and endorsed by multiple agencies. Even then, while networks are being built, the issue is likely to receive media attention.

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[14] Most obviously the link between BSE and CJD (though even that is not universally accepted); but one might also mention the less clear-cut case of "Gulf War syndrome", and even that of the link between MMR and autism or Crohn's Disease, which though still dismissed by the vast weight of scientific opinion is firmly held to have been proved beyond doubt by a section of the public.

Appendices

Details of additional research cited in the report

MORI survey for the Centre for Environmental Risk at the University of East Anglia (UEA), July 2002. MORI interviewed a representative sample of 1,547 adults aged 15 years and older, face-to-face in-home across 125 sampling points in Great Britain between 6-31 July 2002, with sub-samples of approximately 300 used for the detailed questions about each of the five risk cases: climate change, radiation from mobile phones, radioactive waste, GM food and genetic testing. All data have been weighted to the known profile of the British population. Full findings are on MORI's web site www.mori.com, and that of the University of East Anglia, www.uea.ac.uk.

MORI survey for the British Medical Association, February 2003. MORI interviewed a representative quota sample of 1,972 British adults aged 15+. Interviews were conducted face-to-face, in home, on 6-10 February 2003, as part of MORI's CAPI Omnibus. Data were weighted to match the profile of the population. Full findings are on MORI's web site www.mori.com.

Making Britain Family Friendly (MORI survey for the National Family and Parenting Institute). MORI interviewed a representative quota sample of 1,391 British parents on 24-28 April 2003. Interviews were conducted face-to-face, in home as part of MORI's regular CAPI Omnibus survey. Data were weighted to match the profile of the population. Full findings are on MORI's web site www.mori.com.

MORI survey for the Financial Times, June 2003. MORI interviewed a representative quota sample of 1,002 British adults aged 16+. Interviews were conducted by telephone on 20–22 June 2003. Data are weighted to the profile of the population. The results were published in the Financial Times on 30 June-1 July 2003, and are given in full on MORI's web site www.mori.com.

Eurobarometer 57 – survey conducted for the European Commission. Results and details of the Eurobarometer surveys are published on the internet at
http://europa.eu.int/comm/public_opinion.

Scientific risk estimates

Some familiar risks	The chance they will happen
Dying on the road over 50 years of driving	1 in 85
Transmission of measles	1 in 100
Dying of any cause in the next year	1 in 100
Annual risk of death from smoking 10 cigarettes per day	1 in 200
Needing emergency treatment in the next year after being injured by a can, bottle, or jar	1 in 1,00
Needing emergency treatment in the next year after being injured by a bed mattress or pillow	1 in 2000
Death by an accident at home	1 in 7100
Getting five balls in the UK national lottery	1 in 11 098
Death by an accident at work	1 in 40 000
Death playing soccer	1 in 50 000
Death by murder	1 in 100 000
Being hit in your home by a crashing aeroplane	1 in 250 000
Death by rail accident	1 in 500 000
Drowning in the bath in the next year	1 in 685 000
Being struck by lightning	1 in 10 000 000
Death from new variant Creutzfeldt-Jakob disease	1 in 10 000 000
Death from a nuclear power accident	1 in 10 000 000

(Source: British Medical Journal, 27 September 2003, Vol. 327, No. 7417)