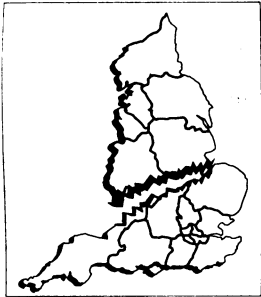


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The Health of the Nation: responses



Coronary heart disease

Hugh Tunstall-Pedoe

The case for coronary heart disease being a key area

The Secretary of State for Health's consultative document *The Health of the Nation* has appropriately listed coronary heart disease first among 16 suggested key areas.¹ It is difficult to envisage a health strategy for England without including coronary heart disease at the top. The document's primary criteria for designating key areas are that they are major causes of premature death, of avoidable ill health, and of economic cost to the NHS and the community. Several diseases rank highly for one criterion alone, but coronary heart disease, the major contributor to cardiovascular disease, is at or near the top in all three. It is the leading cause of death in both sexes and is estimated to cost annually £500m in treatment and £1800m in lost production, besides having accounted for 11.6% of sick leave, in the mid-1980s.²

Other criteria are that the disease should be one in which effective interventions are possible, objectives and targets can be set, and progress can be monitored by means of indicators. Again, coronary heart disease is the chronic disease on which the greatest volume of research has been done: into causation and risk factors (prevention or risk reduction), as well as into monitoring trends in risk factors and the progression of the disease in cohort studies, randomised groups, and geographically defined populations.

A final criterion, for those concerned with reducing inequality, is that mortality from coronary heart disease shows large differences between nations (England scores badly), between English regions and districts (bad for the north and west and the traditional smoke stack areas), between different occupational social classes (bad for manual workers), between ethnic groups (bad for south Asians), and between the sexes (men die earlier and women suffer disproportionate bereavement thereby). Effective coronary prevention has great potential for reducing some of these differences.

What is the case against?

Many of the arguments against making coronary heart disease a key area for a national strategy for health would be those against having such a strategy at all and will not be discussed specifically. Over the past 10 years the case for England not joining other nations in designating coronary heart disease as a key target for a national strategy has been weakened by what has happened elsewhere. Other countries have got their act together and achieved a national consensus for action through collaboration among government agencies, professional bodies, and voluntary organisations. And mortality has fallen even faster. Britain seems to have been acting as the control for other English speaking

nations. Although Britain has produced some outstanding researchers and teachers in cardiovascular epidemiology and prevention, there has been national inertia on prevention. This has been justified by the mistaken argument that as long as one or more academics argue against the prevalent hypotheses, that there are two sides to the argument, the experts therefore disagree and it is safer, wiser, and cheaper to do nothing. The decline in coronary heart disease mortality in Britain has been delayed.

The association between these phenomena for Britain versus several European and English speaking countries is undoubted; the causal relation is not entirely straightforward. A declining mortality and the changing lifestyles and social attitudes against which it is occurring are far more conducive to a prevention programme than one in which mortality is static or rising. The comparative success of the Belgian versus the United Kingdom heart disease prevention project in the early 1970s is usually ascribed to more intensive intervention in the Belgian study and is correlated with the greater overall change in risk factors.³ In fact, the greatest study induced change in self reported cigarette smoking occurred in factories in Britain, where stopping smoking was well established. By contrast, there was virtually no impact of dietary counselling on blood cholesterol concentration in the British factories. It had no support or echoes in the men's previous knowledge or everyday experience. Perhaps its time had not yet come.

Coronary prevention therefore faces a paradox. When the disease is still rising or at its peak the task may be difficult and not widely accepted. When mortality and risk factor levels are declining already the purist could (and some do) argue that no purpose is served by interfering further. A cynic could claim that the guaranteed success of a prevention programme makes it politically desirable. A realist would claim that accelerating and generalising a beneficial trend may be the most cost effective point for concerted action. It may also be true that the general population is prepared to take greater efforts to avoid a disease that is seen to be declining and associated with life's losers than when it is claimed to be the price of a modern lifestyle and executive success.

Another argument used against making coronary heart disease a specific target is that a health strategy should concentrate on health rather than specific diseases. Though it is true that diseases cannot be considered in isolation, the health argument at worst can become metaphysical and untestable. Unless major causes of mortality and morbidity are improved by a health strategy it cannot be considered to be successful. Coronary heart disease should be an identified target but integrated, as in this document, with other diseases, and with lifestyles and risk factors of general relevance.

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What should the targets be?

The consultative document has suggested that the primary target for coronary heart disease should be a 30% reduction nationally in the numbers of deaths in people under 65 between 1988 and the year 2000 (box). Elsewhere in the document it is explained that what is meant is the death rate standardised to the World Health Organisation's European standard population.⁴ This target is simple and measurable as it depends on routine death certification. It is subject to question, firstly, on the size of the target and, secondly, in that it addresses mortality alone and not morbidity or economic cost.

Mortality from coronary heart disease is a moving target—the baseline is not level, and therefore the target mortality is not 30% lower than it would have been without the intervention. The tables show data on England and Wales analysed from a printout provided by WHO. Tables I and II show mortality from coronary heart disease (ICD code 410-414) in men and women by five year age groups from the age of 30 to the age of 69. In 1972 rates were on the high point of a plateau, just before a decline; 1989 is the latest available year. The penultimate column in each table (including table III) shows the rates as standardised to the WHO European standard population (weighted 7 for each age group under 55, 6 for those aged 55-59, and 5 for those aged 60-64, and then divided by 46), and the final column shows the all ages rate without any standardisation (reflecting changes in mortality across all age groups and also the increasing proportion of the population in older age groups). For each year the mortality per 100 000 is followed by that rate as a percentage of the mortality in 1972. Table III shows the average annual decline in mortality over the 17 years since 1972 and for lesser intervals down to one year.

What this mass of figures reveals on close inspection is that the coronary mortality in England and Wales is

Possible target

- 30% Reduction between 1988 and the year 2000 in the number of deaths from coronary heart disease in people under 65

well past its peak and that the climax was reached in different years in different age and sex groups. The decline apparently began earlier and has been greater in the younger age groups than the older ones, and in men rather than women. Rates in the youngest age groups are unstable from year to year because of the small numbers of deaths, and until mortality began to fall in those aged 55-64 the age standardised rate was almost unaffected. Within the past few years, however, the rate of decline has been substantial. In men the age standardised rate in each year has been lower than the previous one since 1978, and in women since 1983. In both sexes rates might now be said to be in free fall. Rates for men under 50 in 1989 are nearly half of those in 1972 while the age standardised rate for the age group 30-64 is down by a third.

The government's proposed target is for a 30% reduction in mortality over the 12 years from 1988 to the year 2000.¹ This means an annual average fall (neglecting compound interest) of 2.5%. An average annual decline of 2.5% certainly seems to be optimistic compared with the average change over 17 years. It equals the rate of change in men over the past 12 years and exceeds that in women. The rate of decline, however, has been accelerating, and compared with the rate of decline over the past 10 years, five years, three years, or two years a decline of 2.5% seems unduly conservative.

One sympathises with the secretary of state's advisers in suggesting a target that seems both credible and feasible, but 2.5% a year seems somewhat pessimistic. The same WHO statistical tables show that countries which began their decline earlier, such as the United States and Australia, have sustained rates of decline near to the 6% achieved in England and Wales in the past few years. Halving of the mortality from premature coronary heart disease not only would be a more striking target than 30%, but also seems reasonable and achievable if the current rate of improvement can be maintained. The 30% should be made 50%.

A mortality target does have the advantage of being based on routinely available death certificates, but it considers only the first of the three criteria for a disease problem. Death certificates are not necessarily subject to verification, and it leaves morbidity and economic cost aside. Though it would be attractive to target reduction in non-fatal myocardial infarction in parallel with mortality, there are probably two reasons why this was not done. Firstly, reports from countries in the vanguard of declining mortality are by no means unanimous in suggesting that non-fatal infarction follows the same trend as mortality. Secondly, special monitoring would be needed, something that needs to be set up and funded long term. Although the protocol for WHO's MONICA project (monitoring cardiovascular disease) was largely written in London⁵ and the quality control centre for event registration is in Britain, the Department of Health in London decided in the early 1980s not to fund any participating centres in England and Wales, leaving Scotland and Northern Ireland to contribute data for the United Kingdom. Coronary event registration has been carried out according to different criteria for some years in Nottingham, but a morbidity target for coronary disease should ideally entail monitoring more than one English population and preferably would use an internationally standardised protocol. Monitoring of myocardial infarction poses one set of problems.

TABLE I—Mortality from coronary heart disease in England and Wales in men by age group and year. Mortality is expressed as rate per 100 000 and as percentages of rate in 1972

Year	Age group (years)									Total
	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	30-64*	
1972	10.9	36.9	95.1	213.8	365.9	576.5	898.7	1417.6	282.8	366.9
1973	10.9	35.2	93.2	210.1	360.0	574.4	885.2	1390.1	279.1	364.4
1974	100.0	95.4	98.0	98.3	98.4	99.6	98.5	98.1	98.7	99.3
	10.4	33.7	96.4	202.7	368.6	573.7	883.5	1383.2	279.2	367.0
1975	95.4	91.3	101.0	94.8	100.7	99.5	98.3	97.6	98.7	100.0
	11.0	30.6	91.8	201.3	375.0	559.0	882.5	1375.0	276.8	370.7
1976	100.9	82.9	96.5	94.2	102.5	97.0	98.2	97.0	97.9	101.0
	9.0	32.9	85.6	188.5	352.9	576.9	890.8	1360.9	273.9	373.5
1977	82.6	89.2	90.0	88.2	96.5	100.0	99.1	96.0	96.9	101.8
	9.3	31.5	88.3	187.6	355.1	564.7	873.1	1367.5	270.8	373.8
1978	85.3	85.4	92.9	87.8	97.1	98.0	97.2	96.5	95.8	101.9
	8.2	35.8	88.0	189.7	367.3	579.1	920.9	1381.7	280.5	386.3
1979	75.2	97.0	92.5	88.7	100.4	100.5	102.5	97.5	99.2	105.3
	10.0	30.5	80.8	189.1	362.1	581.9	926.1	1339.1	278.9	378.1
1980	91.7	82.7	85.0	88.5	99.0	100.9	103.1	94.5	98.6	103.1
	8.9	29.8	80.3	176.1	347.9	577.2	879.3	1314.6	268.7	373.8
1981	81.7	80.8	84.4	82.4	95.1	100.1	97.8	92.7	95.1	101.9
	10.0	28.7	75.9	170.6	326.8	544.4	837.0	1270.8	255.1	369.4
1982	91.7	77.8	79.8	79.8	89.3	94.4	93.1	89.6	90.2	100.7
	9.0	24.7	71.8	157.3	315.2	535.7	826.5	1269.4	247.4	367.4
1983	82.6	66.9	75.5	73.6	86.1	92.9	92.0	89.5	87.6	100.1
	8.2	25.2	68.2	163.5	303.3	531.0	836.7	1316.9	246.7	370.3
1984	75.2	68.3	71.7	76.5	82.9	92.1	93.1	92.9	87.2	100.9
	7.9	22.1	62.4	150.7	287.0	521.7	829.5	1280.4	238.9	366.8
1985	72.5	59.9	65.6	70.5	78.4	90.5	92.3	90.3	84.5	100.0
	6.3	22.8	63.9	146.6	286.8	499.1	841.5	1252.8	236.7	376.6
1986	57.8	61.8	67.2	68.6	78.4	86.6	93.6	88.4	83.7	102.6
	7.1	24.4	59.4	141.6	280.1	483.5	799.4	1205.7	228.0	419.1
1987	65.1	66.1	62.5	66.2	76.6	83.9	89.0	85.1	80.6	114.2
	7.9	21.4	58.6	131.1	259.4	477.2	766.6	1193.6	218.4	355.1
1988	72.5	58.0	61.6	61.3	70.9	82.8	85.3	84.2	77.2	96.8
	8.0	19.6	50.0	125.8	240.6	434.8	751.6	1143.8	206.0	345.4
1989	73.4	53.1	52.6	58.8	65.8	75.4	83.6	80.7	72.8	94.1
	4.8	20.9	49.0	113.3	223.3	397.5	700.1	1094.7	190.4	335.8
	44.0	56.6	51.5	53.0	61.0	69.0	77.9	77.2	67.3	91.5

*WHO European standard population.

TABLE II—Mortality from coronary heart disease in England and Wales in women by age group and year. Mortality is expressed as rate per 100 000 and as percentages of rate in 1972

Year	Age group (years)									Total
	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	30-64*	
1972	2.1	5.5	14.6	33.3	66.6	135.8	272.2	515.7	65.9	254.8
1973	2.0	4.6	16.4	36.5	66.2	132.2	274.2	522.1	66.2	256.3
	95.2	83.6	112.3	109.6	99.4	97.4	100.1	101.2	100.5	100.6
1974	1.4	5.6	16.4	34.3	66.3	140.0	275.8	512.3	67.1	258.9
	66.7	101.8	112.3	103.0	99.6	103.1	101.3	99.3	101.8	101.6
1975	2.3	6.3	14.7	32.5	67.2	136.7	264.4	511.4	65.3	259.9
	109.5	114.6	100.7	97.6	100.9	100.7	97.1	99.2	99.1	102.0
1976	1.7	5.2	16.9	34.1	66.7	133.9	276.2	508.7	66.4	268.2
	80.9	94.6	115.8	102.4	100.2	98.6	101.5	98.6	100.8	105.3
1977	2.1	5.2	14.3	32.5	66.4	132.6	264.8	497.4	64.4	263.5
	100.0	94.6	98.0	97.6	99.7	97.6	97.3	96.5	97.8	103.4
1978	1.9	5.9	14.8	31.7	71.5	138.4	277.4	517.1	67.3	270.1
	90.5	107.3	101.4	95.2	107.4	101.9	101.9	100.3	102.2	106.0
1979	2.1	4.4	13.8	32.3	73.1	137.5	284.1	493.1	67.9	258.1
	100.0	80.0	94.5	97.0	109.8	101.3	104.4	95.6	103.1	101.3
1980	2.1	4.5	12.7	27.1	63.5	141.2	275.9	490.4	65.1	256.2
	100.0	81.8	87.0	81.4	95.4	104.0	101.4	95.1	98.9	100.6
1981	2.0	4.7	12.9	27.3	64.0	134.4	250.9	480.4	61.7	259.5
	95.2	85.5	88.4	82.0	96.1	99.0	92.2	93.2	93.7	101.8
1982	1.2	4.2	10.9	24.4	62.4	131.2	256.0	483.0	60.6	258.8
	57.1	76.4	74.7	73.3	93.7	96.6	94.1	93.7	92.0	101.6
1983	1.8	4.4	10.2	25.8	62.2	138.4	265.4	487.2	62.8	263.1
	85.7	80.0	69.9	77.5	93.4	101.9	97.5	94.5	95.3	103.3
1984	1.7	3.4	9.6	24.6	59.3	134.2	264.9	488.4	61.3	268.7
	85.7	61.8	65.8	73.9	89.0	98.8	97.3	94.7	93.1	105.5
1985	1.5	3.6	9.2	23.6	58.5	129.2	269.1	479.0	60.8	279.3
	71.4	65.5	63.0	70.9	87.8	95.1	98.9	92.9	92.3	109.6
1986	1.4	4.5	8.7	22.1	53.2	125.4	261.5	471.7	58.5	271.1
	66.7	81.8	59.6	66.4	79.9	92.3	96.1	91.5	88.8	106.4
1987	1.8	3.9	8.2	21.6	50.6	122.0	261.6	470.5	57.5	265.1
	85.7	70.9	56.2	64.9	76.0	89.8	96.1	91.2	87.3	104.0
1988	1.1	3.6	8.3	19.0	46.6	109.6	249.4	452.7	53.4	264.2
	52.4	65.5	56.9	57.1	70.0	80.7	91.6	87.8	81.1	103.7
1989	1.2	3.3	7.4	17.1	43.4	107.1	234.5	442.1	50.5	262.4
	57.1	60.0	50.7	51.4	65.2	78.9	86.2	85.7	76.7	103.0

*WHO European standard population.

TABLE III—Average annual percentage decline in mortality from coronary heart disease in men and women over different time intervals up to 1989

Period (years)	Age group (years)									Total
	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	30-64*	
	<i>Men</i>									
17	3.3	2.6	2.9	2.8	2.3	1.8	1.3	1.3	1.9	0.5
12	4.0	2.8	3.7	3.3	3.1	2.5	1.7	1.7	2.5	0.8
10	5.2	3.1	3.9	4.0	3.8	3.2	2.4	1.8	3.2	1.1
5	7.8	1.1	4.3	5.0	4.4	4.8	3.1	2.9	4.1	1.7
3	10.8	4.8	5.8	6.7	6.8	5.9	4.1	3.1	5.5	6.6
2	19.6	1.2	8.2	6.8	7.0	8.4	4.3	4.1	6.4	2.7
1	40.0	+6.6	2.0	9.9	7.2	8.6	6.9	4.3	7.6	2.8
	<i>Women</i>									
17	2.5	2.4	2.9	2.9	2.0	1.2	0.8	0.8	1.4	+0.2
12	3.6	3.0	4.0	3.9	2.9	1.6	1.0	0.9	1.8	0.0
10	4.3	2.5	4.6	4.7	4.1	2.2	1.7	1.0	2.6	+0.2
5	5.9	0.6	4.6	6.1	5.4	4.0	2.3	1.9	3.5	0.5
3	4.8	8.9	5.0	7.5	6.1	4.9	3.4	2.1	4.6	1.1
2	16.7	7.7	4.9	10.4	7.1	6.1	5.2	3.0	6.1	0.5
1	+9.1	8.3	10.8	10.0	6.9	2.3	6.0	2.3	5.4	0.7

*Who European standard population.

Monitoring angina pectoris (not included in the MONICA project), would pose another. Given the cost of angina pectoris to the NHS and its importance these problems ought to be looked at seriously.

What should the strategy for reaching the targets be?

The consultative document lists smoking, diet (including blood cholesterol concentration), physical fitness, and blood pressure as relevant risk factors that can be influenced. Each is considered as a separate key area and will be discussed as such by other commentators in this series of articles, so my comments will be brief and selective.

How much the decline in mortality from coronary heart disease is related to changes in the major known risk factors in England and elsewhere, and how much to factors unknown, remains controversial (and was the dilemma in the US that led to WHO's MONICA initiative in 1979.⁵). In general, however, declining mortality has been associated with improving risk

factor levels. Hastening these improvements should benefit both individual people and populations.

Cigarette smoking is an avoidable factor. It is an addictive drug that kills, accounting for a large proportion of premature deaths from coronary disease. It should be recognised and treated as such. British ambivalence and mixed messages should end. Every encouragement should be given to smokers to stop while limiting their opportunities to smoke anywhere except as consenting adults in private. We should aim to raise a smoke free generation of teenagers (both in the active and passive sense) for the next century. It is inconceivable that tobacco advertising will be legal in Britain for much longer, though whether it is this government or a subsequent one that makes the inevitable decision remains to be seen. In Europe we seem to be dragging our feet.

The consultative document's comments on diet came out just before a report by the Committee on Medical Aspects of Food Policy.⁶ Dietary trends in the middle class seem to be generally favourable, although dietary fat composition seems to be changing more than total consumption. This is probably contributed to by the poor average standard of nutrition labelling in Britain coupled with the tendency of the food industry to remove fat from foods where it is noticed and put it back into foods where it isn't. However, there are concerns about the nutrition of young people, a disproportionate percentage of whom are raised in low income households. Many home providers have no knowledge or training in cooking or nutrition, which does not figure in the core school curriculum, and there are no national nutritional standards for school meals. The educational gap is filled by commercial promotion of products with the greatest added value rather than those with greatest nutritional value.

British blood cholesterol concentrations are high by international standards,⁷ and to set a target to lower them to current American values by the end of the century is reasonable. This could be achieved by a national nutrition policy rather than by mass cholesterol testing and drugs.⁸ (Paradoxically, in view of the decline in mortality, what poor British data there are suggest that cholesterol concentrations have not changed in the past decade,^{8,10} so they are not the engine of that decline, although other dietary changes may be.) Although diet is an immensely complex subject, what is encouraging is the large degree of congruence between the dietary recommendations for minimising the risk of several different disease problems.¹¹

In exercise the problem is to change physical exertion from a competitive activity predicated on success in teenagers and young adults to a social activity for all mature adults, designed into the urban environment.

In the monitoring of coronary risk factors England has again suffered in comparison with Scotland and Northern Ireland by not participating in WHO's MONICA project.^{5,7} This is generating international comparative and longitudinal data on risk factors and trends in defined communities, the first large scale results coming from the early to mid-1980s. This deficiency will now be remedied, albeit on small national population samples.

What are the problems in achieving the targets?

England has been late in attempting to set up a health strategy, having failed to respond to the WHO initiative¹² or to the American example,¹³ for several years. The consultative document shows a significant change of attitude at the highest level in the Department of Health, whose attitude to such WHO initiatives in the past, and to British researchers involved in them, has not always been encouraging. However,

these welcome strategy initiatives have to outlast the present secretary of state and the present government. They need to be endorsed and supported not only by professional groups, voluntary bodies, and public opinion but also by all the relevant government departments within Whitehall, some of which can make major decisions helping or harming the public health without it being in their remit to take it into account. Such decisions need to be coordinated at Cabinet level, as has been done in other countries and as was recommended first in the Canterbury report,¹⁴ and subsequently by the National Forum for Coronary Heart Disease Prevention on several occasions.¹⁵

Other problems with the strategy relate to the different components of the United Kingdom and the degree to which decision making is delegated downwards to health regions and districts and upwards to the European Community. A health strategy and targets for England alone are complicated by the historical amalgamation of health statistics with Wales, Wales, Scotland, and Northern Ireland have a degree of autonomy in their health strategies. Because England is central and makes up the bulk of the United Kingdom it is difficult for the other three territories to operate entirely independently. Perhaps the recent appointment of the Scottish chief medical officer to the English post will help coordination.

By the year 2000 the health strategies for different European states will need to be better coordinated and they will need consistently high standards of health monitoring to assess the impact of their single market policies on diverse populations. In the 1970s the European Commission seemed to be ignoring health and subsidising not only tobacco but almost all the agricultural products containing saturated fat. In the past few years some health initiatives from Brussels (which continues to subsidise tobacco production) have produced ambivalent or negative reactions from London, sometimes for doctrinaire reasons concerned with who decides. It is to be hoped that health promotion initiatives in England in the future will not be delayed just because other Europeans are enthusiastic.

Conclusion

Coronary heart disease is a major health problem that demands a powerful response. The target for

reducing mortality from premature coronary heart disease by the year 2000 should be 50% and not 30%. Monitoring of morbidity should be instituted and appropriate targets developed. Monitoring of risk factors in England has been inadequate and was rightly criticised by the public accounts committee.^{16,17} Current proposals for monitoring in England are welcome but inadequate to report what is happening to regional and social subgroups in an increasingly heterogeneous population. The establishment of strong national smoking and nutrition policies should be an urgent priority.

Tabulations of mortality for different countries from the 1950s were provided by WHO Geneva. The views expressed here are those of the author and not those of any funding body.

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Importance of obesity

John Garrow

Circulatory disease, cancers, and respiratory disease account for 21%, 26% and 5% respectively of years of life lost up to the age of 65 and 13%, 7%, and 6% respectively of NHS expenditure.¹ These are the three biggest causes of mortality and morbidity. Obesity contributes to deaths from all three of these causes and is also associated with other diseases (figure), which makes it a prime candidate for being recognised as a key area.

For two decades it has been the received wisdom among epidemiologists that obesity is not an independent risk factor for cardiovascular disease. The seven nations study showed that if you know the age, blood pressure, smoking habits, and serum cholesterol concentration of men aged 40-60 then knowing their adiposity does not help to make any better prediction about which men will have a heart attack in the next

five years.² Even if this premise is correct (and other investigators have reached different conclusions from analysis of the same data³) it does not follow that obesity is benign—it has been called the most readily identifiable of all risk factors.⁴

How obesity causes disease

Recent work on obesity in animal models has shown that the primary metabolic defect is a reduced sensitivity to insulin, from which all the other metabolic characteristics associated with obesity follow.⁵ The classic study by Sims *et al* showed that if experimental obesity is produced by prolonged overfeeding of normal men with no family history of diabetes a similar syndrome of insulin insensitivity is produced, which reverts to normal with weight loss.⁶ Susceptibil-