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REVIEW

WHO recognition of the global obesity epidemic

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The recognition of obesity as a disease was in theory established in 1948 by WHO's (World Health Organization) taking on the International Classification of Diseases but the early highlighting of the potential public health problem in the United States and the United Kingdom 35 years ago was considered irrelevant elsewhere. The medical profession disregarded obesity as important despite the new evidence and WHO data set out in the 1980s. Only in 1995 did WHO find greater problems of overweight than underweight in many developing countries but it required the first special obesity consultation in 1997 and particularly the Millennium burden of disease analyses to suddenly highlight its crucial role in the current unmanageable and escalating medical costs globally. Governments now recognize the overwhelming industrial developments that guarantee an escalating epidemic but neither they nor WHO know how to engage in changing the societal framework to promote routine spontaneous physical activity and a transformation of the food system so that low energy-density food of high nutrient quality becomes the norm.
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Introduction

Formation of WHO with obesity already classified as a disease
WHO (World Health Organization), when it was established in 1948, had not only to consider for the first time the global pattern of diseases and their prevention, but also incorporate pre-existing international work on any major health issue. The International Classification of Diseases (ICD) had already been formally adopted for international use by 1900 because pathologists were anxious to have an agreed set of criteria for comparing disease rates. So, in 1948, the 6th ICD version was set out by WHO and covered a huge range of problems from infections and parasitic disease, congenital abnormalities, cancers, cardiovascular diseases and neurological disorders to such issues as accidents and violent deaths. It is interesting, therefore, to note that obesity was then specified as a disease and this has been retained throughout the updating process. Thus, in 1975, the ICD 9 version had 'obesity and other hyperalimentation' registered in categories E65–67. Then a clinical modification was introduced in the United States in 1979, with morbid obesity added in 1995 before ICD 10 was phased in during the mid 1990s. So throughout more than the last half century, pathologists and WHO have recognized obesity as a disease.

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Obesity ignored: of little clinical significance
The ICD depended upon a pathologist's view of the post-mortem experience. The rest of the medical world, however, was concerned with clinical issues and their management. To them, any clinical difficulties induced by obesity were readily curable by simply reducing food intake. This required discipline by the patient as advised by their doctor. They considered any major nutritional problems to relate to the 'developing world'. The only exceptions seemed to be the nutritional complications of gastrointestinal disease or unusual genetic abnormalities and children's needs for growing well.

Keys: obesity is not a risk factor for cardiovascular diseases
The neglect of obesity by medical authorities can probably be traced to the remarkable Seven Country Studies[1] on cardiovascular disease (CVD), initiated by Ancel Keys who was already famous for his classic experiments on the effects of semi-starvation in conscientious objectors. Keys, with a combination of meticulous metabolic feeding studies on the determinants of blood cholesterol levels, together with metabolic epidemiological assessments of middle-aged men in Japan, Mediterranean countries, Northern Europe and the United States, had shown that there was no relationship between obesity and the prevalence or death rates from stroke or coronary heart disease. Keys insisted on excluding obesity as a problem because Greek men had the highest body mass indices (BMIs) but very low rates of cardiovascular disease. Other epidemiologists such as Shaper,[2] in his studies

of rural recruits to the Kenyan army, did note that on transfer into the army and an urban environment, body weights, blood pressure and serum cholesterol all rose, and much of their discussion involved the role of increased body weight and body fat. There were also, however, marked increases in salt and dietary fat intakes.

WHO began to become concerned about CVDs in the 1970s. Keys had already persuaded the American Heart Association to launch campaigns to reduce saturated fat intake and, in 1962, the Norwegian Government had established the first coordinated strategy to limit the accelerating epidemic of heart disease.[3] Given these developments, WHO established the MONICA Surveys as sentinel surveys for monitoring differences and changes in CVDs in middle-aged men and women in many countries globally.[4] Heights and weights were included in the measurements but these were routine additions rather than important criteria.

Early national initiatives on obesity

Obesity only became an issue of potential government concern in the mid-1970s when Bray produced the Fogarty reports in the United States[5] and we, in the United Kingdom, reported on research needs in obesity for the government and the Medical Research Council.[6] These reports stimulated the establishment of research centres, but little further government action, and WHO considered this was not their concern because their priority lay with the problems of the so-called Third World. By the early 1980s, a further major report for the London Royal College of Physicians highlighted the public health implications of obesity,[7] this being hailed by their Council as their most important report since Doll's analysis of the hazards of smoking. Again, however, the UK government and WHO ignored the issue.

WHO/FAO/UNU report on protein and energy requirements

In 1981, a conjoint UN panel was organized to reassess protein and energy requirements and obesity again impacted on these analyses. Our research at the MRC Clinical Nutrition Centre in Cambridge, UK with whole body calorimeters, built to study the energy needs of volunteers and obese patients, proved particularly valuable. The energy metabolism of adults was found to be remarkably well-controlled: if fed the same intake and exercised under controlled conditions, the 24 h energy expenditure varied by less than 2%. Furthermore, the huge range in the energy requirements of the population, when expressed as the total energy output on a 24 h basis, could be standardized by expressing each individual's value as a ratio of their BMR (basal metabolic rate); this ratio was designated as the physical activity level. The analysis on the basis of the physical activity level immediately rationalized the differences between individuals. As the variation in daily energy expenditure was much less than daily intake changes, a simple evaluation of energy output then allowed a specification of food needs provided body weight was stable. The focus on energy output was reinforced when it was shown that obese individuals usually underestimated their intake as they constantly tried to limit their food intake. Furthermore, a reanalysis of the supposed energy efficiency of people in the developing world revealed spurious data based on reported low intakes when their higher corresponding energy expenditure values were remarkably similar to those predicted from the Cambridge calorimetric work.[8]

At the UN meeting in Rome, the preliminary BMR data seemed flawed by including adolescent data in the adult analyses, so fundamental recalculations of energy needs were required. This led to the current predictions of BMR for children and adults throughout the world[9] and a calculation of all the physical costs of exercise provided by different reports, which could again be standardized by expressing them as a ratio to the predicted BMR.[10] This report, now considered a classic, was used to consider world food needs and the prevention of malnutrition.[11] The analyses of energy requirements, however, did lead to a more rational analysis of different people's food needs based on their physical size and occupational profiles.[10] Again obesity was not a priority.

WHO strategies for the prevention of cardiovascular disease

In 1984, Geoffrey Rose from London and Henry Blackburn (Keys' successor) from Minnesota produced their first classic report on the prevention of CVDs.[12] They argued for a population-wide strategy by highlighting the importance of reducing the average cholesterol level of the population as well as treating those with severe hypercholesterolaemia. They set a 15–30% range for fat intakes with the upper figure chosen because US and Northern European fat intakes were 42–43%, and the 15% value came from WHO's international perspective and the recognition that most Asian countries were eating $<15\%$ fat. Reducing total fat intake to 30% was primarily a pragmatic decision to reduce saturated fat intakes, and obesity was not an issue, given the epidemiological view that simply considered weight gain as a risk factor for high blood pressure and increased blood cholesterol levels.

The WHO European 1988 and WHO 797 report in 1990

The first Nutrition and Chronic Disease Report for the European Region of WHO[13] had a separate chapter on obesity highlighting its importance in 1988 and these analyses led to the WHO Geneva having the first global Expert Technical Consultation on Diet, Nutrition and the Prevention of Chronic Diseases. The resulting 797 report produced an integrated analysis of the global problems, and again obesity had its own section, with the link to dietary fat being highlighted by showing the progressive increase in BMI in Brazilian men with increasing dietary fat whatever the sources of fat in their diets.[14] However, the 797 report immediately became highly controversial because sugar

intake goals were set within the 0–10% energy range based on the non-essentiality of sucrose and its role in promoting dental caries. Observers from the food industry immediately warned the global network of sugar interests of the perceived threat to their business expansion. It was therefore not surprising to find two powerful national representatives at the WHO Executive Board questioning the validity of the report without being able to present any scientific arguments.

WHO anthropometric criteria for health

By the early 1990s, the prevalence of childhood malnutrition had become a major political issue so there was a need to ensure appropriate methods for its assessment. WHO convened four teams in 1993 to consider how to assess a nation's problem of either malnutrition or obesity in both children and adults. The childhood obesity criteria were simply set on the usual WHO statistical basis as that equivalent to weight-for-heights in excess of +2 s.d. limit. WHO also accepted our earlier specification of the three grades of adult chronic energy deficiency[15] as 'underweight' with BMI cut-points of 16.0, 17.0 and 18.5 kg/m^2. The overweight and obesity group defined overweight as obesity related to a BMI of 25–29.9 kg/m^2 (grade 1), with grade 2 overweight commonly termed as obesity specified for a BMI of 30–39.9 kg/m^2, and grade 3 or morbid obesity as applying to those with BMI $\geqslant$40 kg/m^2. This technical report was seen as a background document with no particular policy implications.

WHO reluctance to recognize obesity as a global problem

By 1995, obesity in the Western World had become a major issue for obesity specialists but still many national governments refused to take it seriously. The United Kingdom, however, in that year had produced a report on the prevention of obesity[16] and at the same time the Scottish Royal College of Physicians were attempting to cope with the challenge of managing so many obese patients by drawing up new management guidelines.[17] Nevertheless a small group of frustrated physicians was considering how to galvanize a new approach by the medical establishment and Ministers of Health. The International Obesity TaskForce (IOTF) was therefore established with the express purpose of having a special consultation in WHO Geneva, which would be solely devoted to obesity. The difficulty with this proposition, however, was that WHO officials considered that obesity was a problem for the affluent Western world and irrelevant to Third World concerns; it could therefore not legitimately be handled by WHO Headquarters. This view was maintained despite earlier analyses included in the WHO anthropometry report showing that overweight and obesity were far more prevalent than underweight in adults living in Latin America and North Africa, and only South-East Asia and those countries exposed to famine and war had high levels of chronic energy deficiency.

Despite this WHO resistance, the IOTF established 11 subcommittees and a Council of global leaders to collate the evidence on obesity with a special effort to include developing country issues although at that stage not much relevant work was available. However, having proven with additional data that obesity was becoming a problem in the developing world, WHO agreed to hold a meeting but only if it was delayed for 6 months so that both FAO (Food and Agriculture Organization) and WHO could hold a special technical consultation on carbohydrates. FAO and WHO were separately supported in this endeavour by the International Life Sciences Institute (ILSI), the organization established by the food industry to interact with academics, governments and the public. As expected, the original FAO report exonerated sugar from any blame for dental caries and the issue of obesity was not included as a major issue relating to sugar. An attempt was also made to finalize the measurement of fibre so that many routine products, for example, cornflakes, could be labelled as high in fibre when in practice they had little or no non-starch polysaccharides, but contained many products of the Maillard reaction between the sugar and amino acid components of the food. This report was subsequently set aside as having been conducted in an improper manner and a new report has now been issued.[18]

When the WHO Obesity meeting was finally convened, the IOTF draft became the working basis for the meeting and in practice, only minor modifications to the report were made. The nomenclature of overweight was retained but an additional cut-point of BMI 35 kg/m^2 was included in the obesity range. Despite some suggestions from WHO officials that sugar needed to be included in the range of factors contributing to obesity, at that stage the IOTF drafting group had not collated strong enough evidence to warrant a specified limit on sugar intake. The report did not highlight sugar as a problem but did conclude that, from an obesity point of view, the fat intake of a population should probably not exceed 20–25% rather than the earlier designated 30% value set for CVD.

The meeting was conducted as a full Expert Technical Consultation, but in practice this proposal had not been agreed by the WHO Executive Board as part of its Biennial Plan. Nevertheless discussions with the then Director General, Dr Nakajima, led to WHO's acceptance that they would need to take it through a process that allowed the report's inclusion in the official Technical Report Series. These are formally accepted by the WHO Executive Board and have an almost legal basis as far as most national governments in the developing world are concerned, despite the routine statement by WHO that the views of the expert groups do not necessarily reflect that of WHO.

As usual, the whole document had to be re-edited by WHO so that the language was sufficiently explicit to allow its translation into the other official languages. However, there was a huge backlog of reports being processed, so WHO

agreed to issue an interim document in English in 1998, which IOTF then distributed directly to every Minister of Health in the 192 member countries. It was subsequently produced in the standard format of WHO Expert Reports.[19]

WHO global burden of disease analyses

The importance of the WHO obesity report was enormously enhanced when WHO decided to undertake an exceptionally ambitious task of assessing what the principal risk factors are for the total burden of premature death and disability on a global basis. The IOTF was asked to asses global weights and heights and where possible produce regression equations for the development of as many of the WHO defined diseases as could be shown to be induced or amplified by weight gain. The counterfactual process required a specification of the ideal values for average body weights for the whole population in each designated age group rather than pragmatic targets for body weight changes. This, together with the ideal standard deviation of the mean weight range and the WHO estimated disease and death rates, allowed the attributable effect of excess weight, that is, from any increase above the ideal, to be assessed quantitatively for all the major diseases in the designated 14 subregions of the world. These analyses have been presented extensively[20,21] and revealed that excess adult BMIs were in the top 10 risk factors for the burden of disease whether one was considering the high-income countries of Japan and the West or the low and middle income countries of what used to be termed the developing world. Since then the analyses have been updated by WHO in conjunction with the World Bank and, in their 2006 assessment, excess weight gain had moved up to the third rank as the most important risk in high-income countries.[22] The data incorporated estimates of the impact of excess weight gain on several cancers, which were also being considered by a special group working for the International Agency for Research on Cancer which is part of WHO.[23]

Regional WHO initiatives: Western Pacific—Oceania

The early recognition that Asians usually had appreciably lower BMIs and that the comorbidities seemed to become evident with very modest increases in weight, led to a meeting of the Western Pacific Regional Office of WHO, together with the International Association for the Study of Obesity and IOTF representatives in Hong Kong in 2000. On the basis of preliminary receiver operating characteristic analyses of the likelihood of co-morbidities being present at different levels of BMI it was decided to take the cutoff point for overweight as a BMI of 23 kg/m^2. By then the Japanese government was already considering that obesity was to be specified when BMIs exceeded 25 kg/m^2. This meeting was not, however, a wide ranging consultation on the appropriateness of Asian criteria; this had to wait until a larger meeting could be convened in Singapore in 2002.[24] Preliminary data according to a predetermined IOTF plan was assembled[25] but further analyses available at the Singapore meeting allowed a careful scrutiny of many national and regional datasets. At that stage it seemed that perhaps relating comorbidities to body fat levels of the different ethnic groups might be more appropriate than simply considering BMI as the first reference point. However, it was recognized that Indians had the highest proportion of body weight as fat, this being evident from birth. The Chinese and Malays had less body fat but still more than that observed in Caucasians. However, in Thailand, the rural Thais were more like Caucasians, whereas urban dwellers, already showing marked increases in BMI and comorbidities, had intermediate proportions of body fat similar to those of the Chinese. This implied that there was some environmental factor that determined the proportion of lean and fat tissues. The Singapore meeting finally concluded that in Asia the optimum values for overweight and obesity using similar criteria varied. Most governments would need to think about both therapeutic and preventive initiatives for those with BMIs above 23 kg/m^2; an intermediate level of BMI 27.5 kg/m^2 was suggested as another potential cutoff point in Asia for those with a substantially increased risk of comorbidities. By then the Chinese academic community had combined their data and suggested that the overweight cutoff point should start at a BMI of 24 kg/m^2, with a pragmatic choice of BMI 28 kg/m^2 for specifying obesity and the need for detailed management.

Pan American Health Organization

The Pan American Health Organization (PAHO) did not initially consider obesity as a problem until Peña and Bacallao assembled data from a number of countries in Central and South America; they showed that obesity was now a feature linked to poverty and often associated with coexisting malnutrition in families as well as in the general community.[26] IOTF had already helped to stimulate developments in the Caribbean, linked to PAHO initiatives, with Barbados taking the lead at a Commonwealth Health Ministers Conference in 1998. An evaluation of progress in 2002 showed that PAHO, in association with the Chief Medical Officers of Health of each of the Caribbean countries, had agreed on a prevention strategy but the academic community and civil society seemed unaware of these initiatives. So it looked as though at that time too much reliance had been placed on governmental action.

WHO 916 report on diet, physical activity and chronic disease

This consultation in effect revisited the issues dealt with 11 years previously in the 1990 797 report.[27,28] However, on this occasion it was decided not to include the problems of childhood malnutrition and because WHO had already enacted its first international law relating to tobacco restrictions, this initiative became immediately a high-profile

event. Derek Yach, the WHO Assistant Director General of Chronic Disease, developed an open consultative process so that proposals and assessments of the draft report could be taken on board. On this occasion obesity became a prominent if not dominant feature and it was concluded that obesity prevention needed restricted sugar intakes and markedly reduced food energy densities. Otherwise the population goals were very similar to the original 797 criteria and, interestingly, the upper fat goal was not reduced below 30 kg/m^2, this value again being set by the cardiological group.

The 916 report became highly contentious after its launch by the Director Generals of both WHO and FAO in Rome in 2003, when over 100 Ministers of Agriculture rejected its analysis and conclusions at their next annual FAO meeting. The Ministries of Agriculture were again of the opinion that the sugar goals were unscientifically derived and would have a damaging effect on the economies of the developing world. The Ministers rejected the validity of the 916 report despite FAO setting out the agricultural opportunities. Additional World Bank analyses confirmed that the overall implications of the 916 report were of substantial benefit to farmers in the Third World. They would benefit even further if Europe and the United States abolished their selective import tariffs and export subsidies, which currently distort world food prices, particularly of fats, oils and sugars.

WHO global strategy on diet and nutrition

After the 916 report, WHO attempted to start a practical scheme to combat obesity and chronic diseases by having the World Health Assembly in 2002 agree on a preventive strategy. This strategy was only agreed upon after member states agreed to remove any reference to the WHO 916 report. Delegations from several low and middle income countries opposed reference to the supposedly flawed sugar section and concerns for coconut oil interests. Despite these objections, WHO, with the help of the South African Minister of Health, finally obtained agreement for the global strategy.

WHO Kobe meeting on childhood obesity

A major effort by many obesity experts went into preparing a WHO meeting in Kobe, Japan in 2005 dealing specifically with childhood obesity. A new IOTF report on childhood obesity was initially produced[29] followed by further extensive drafts. The Kobe report has been finalized but has still not been published by WHO 3 years after the meeting.

WHO European initiatives

European action plan. WHO Euro had a long tradition of innovative work in dealing with the problems of CVDs and in 2004 finalized a comprehensive report,[30] which drew heavily on some of the new approaches to environmental change for obesity set out by the IOTF's prevention group. WHO also extended Swinburn's analyses of micro and macro environmental changes in the physical, economic, policy and cultural domains and extended the medical concept of prevention by including aspects of food safety and agricultural sustainability. This reflects the need in government for an integrated approach to policy making. The WHO EURO office also stimulated a large number of countries, beginning in Scandinavia, to evolve new action plans to combat obesity.

Istanbul consensus on obesity. Following the 916 report, the WHO EURO office decided that obesity was becoming such a problem in Europe that a major meeting was needed for all the Ministers of Health and a substantial background document was produced for governmental use.[31] A draft of a Charter to drive home the need for action rather than just grand pronouncements was also produced. The Charter was agreed after intense negotiations of every phrase. Nevertheless, the 48 Ministers signed the Charter that emphasized the importance of regulatory and other government led initiatives and sought radical preventive measures.[32]

PAHO Caribbean prime ministerial meeting

More recently, after extensive work as personal advisor to the Prime Ministers of the Caribbean by Sir George Alleyne, ex-Regional Director of PAHO, a one-day meeting of 16 Prime Ministers was convened in Trinidad in September 2007 with WHO Geneva and PAHO support. This meeting focused on adult chronic diseases but with an emphasis on the problems of tobacco use and obesity. An agreed plan was announced to implement ever more stringently the Tobacco Framework and all Ministers of Health now have to devise an intersectoral plan by the summer of 2008 to counteract obesity, which the Prime Ministers recognize is leading to unsustainable medical costs for diabetes, hypertension, stroke and coronary heart disease throughout the Caribbean.

Following this meeting PAHO is supporting multiple initiatives in different parts of Latin America and special meetings are due in Chile with other regional meetings planned for late 2008. It is also planned that the (British) Commonwealth Heads of Government meeting in 2009 in Trinidad will feature a special session on obesity and the prevention of chronic diseases.

Conclusions

Although governments and academics in North America and Northern Europe see WHO as a valuable resource to help other countries combat their medical problems, WHO is in fact enormously influential in steering the thinking of most governments. It has relatively modest means for the

enormous demands made on it but it can draw on global expertise to produce very authoritative reports and advisory documents. Nevertheless, it is not often realized that the World Assembly delegations agreeing new policies are essentially controlled by the foreign services of the member states and they often overturn the views of their own Ministries of Health if there are strong economic arguments from the Trade or Agriculture departments.

Some countries, particularly the United States under the Bush administration, have also led a movement to persuade other member states that WHO should merely be the servant of its membership and not take the lead that was the strength of WHO, for example, during the years when Drs Mahler and Harlem Brundland were Director Generals. Obesity has become a highly contentious issue in part because the United States not only has one of the highest obesity rates in the world but has also led the industrial transformation of society to produce the 'toxic environment' now accepted by most governments as the problem. The UK Chief Scientist, who produced the recent UK Foresight report on Obesity considered that obesity is another outcome of a failure in the reliance of governments on the free market to solve medical and social problems. The food chain and the oil, car, road-building, TV, entertainment and advertising industries themselves often specify that some of their members may have contributed to the obesity epidemic and are understandably concerned with ensuring that their financial interests are not compromised by government intervention. The work of academics and others in the public sector is therefore vital and needs to continue to support a beleaguered WHO. The highlighting of obesity as a major public health issue is now uncontroversial (except perhaps in the United States) but the principal and radical practical steps needed to reverse this epidemic is the next challenge.

Conflict of interest

The author has declared no conflict of interest.

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