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Appropriating Risk Factors: The Reception of an American Approach to Chronic Disease in the two German States, *c.* 1950–1990

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Summary. Risk factors have become a dominant approach to the aetiology of chronic disease worldwide. The concept emerged in the new field of chronic disease epidemiology in the United States in the 1950s, around near-iconic projects such as the Framingham Heart Study. In this article I examine how chronic disease epidemiology and the risk factor concept were adopted and adapted in the two German states. I draw on case studies that illuminate the characteristics of the different contexts and different take on traditions in social hygiene, social medicine and epidemiology. I also look at critics of the risk factor approach in East and West Germany, who viewed risk factors as intellectually dishonest and a new surveillance tool.

Keywords: risk factors; epidemiology; chronic disease; Germany

Introduction

This paper deals with the reception in both German states of the risk factor approach, the idea that there are quantifiable factors, often associated with lifestyle, that make it possible to calculate the probability that an individual develops an illness and dies prematurely. Risk factors had their origins in American chronic disease epidemiology but were adopted in both German states despite the different political and economic contexts: a centralised, government-controlled health system in the planned economy of the German Democratic Republic (GDR) and a decentralised system relying on checks and balances between more or less autonomous sickness insurance funds, doctors organisations and other stakeholders in the market economy of the Federal Republic (FRG).[1]

The health systems in both German states had their foundations in different solutions to the escalating conflicts between doctors' organisations and the sickness insurance funds (one tier of the social insurance system introduced by Bismarck) over pay and contracts in the interwar period, reflecting different ideas about the future of the welfare state.[2] Models developed by socialist doctors and social hygienists in the Weimar Republic that were opposed by large

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[1] Süß in Hockerts (ed.) 1998, v. Ferber in Blohmke *et al.* (eds) 1977.

[2] Most doctors, as members of the educated bourgeoisie had political allegiances on the right, while the large health insurance funds were controlled by social democrats with trade union affiliations. See Timmermann 1999, esp pp. 21–64; Hubenstorf in Pross and Aly (eds) 1989; Hansen *et al.* 1981; Tennstedt 1977.

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sections of the medical profession, such as health centres with salaried doctors (*Ambulatorien*), played a major role in the Soviet-occupied Eastern 'Zone' after World War II, where trade unionists and former sickness insurance fund managers, as well as socialist physicians and social hygienists were involved in the centrally planned reorganisation of the health service.[3] In West Germany, in contrast, the autonomy (*Selbstverwaltung*) of the organisations of doctors and sickness insurance funds was paramount, albeit less democratic and with tighter legal constraints than before 1933. In the planned economy of the GDR the health services were highly integrated, coordinated and controlled by the government, which had advantages when it came to organising immunisation or mass X-ray campaigns, or the maintenance of databases such as the GDR cancer register.[4] A shortage of funds, however, led to problems at many levels.[5] In the health system of the Federal Republic with its multi-centric structures, the government played a far less central role than in the GDR. The state merely controlled the legal and regulatory framework governing the interactions between the organisations of doctors, insurance funds and other stakeholders such as the pharmaceutical industry, hospital operators, representatives of medical science, and increasingly also patient organisations.[6] In academic medicine, there were some new institutions launched in both German states, but intellectual traditions only gradually adapted to the new post-war contexts.[7]

Chronic Disease Epidemiology and the Emergence of the Risk Factor Approach

Risk factors are a relatively recent idea which emerged in the United States in the 1950s, as Robert Aronowitz, William Rothstein and others have shown, from within a new field of medical research, chronic disease epidemiology.[8] Epidemiology is the science of epidemics, dealing with the incidence, distribution, and control of disease in a population. Up to the mid twentieth century epidemiologists were predominantly concerned with communicable illnesses. Chronic disease epidemiology developed after World War II in the USA. Its main target was the aetiology of cardiovascular disease, which was increasingly perceived as the number one health problem of industrialised societies. Among the questions that the new discipline addressed was if this increased visibility in fact corresponded to a higher incidence of cardiovascular illnesses, or if people simply stopped dying from tuberculosis, lived longer, and died from heart problems instead. Many talked about an epidemic of heart disease in the USA earlier than in other industrial nations. Traditionally epidemiology dealt with illnesses whose incubation periods were relatively short, making them easier to study. The new chronic disease epidemiologists looked at illnesses that developed over years and for which it was difficult to determine the point at which relative health turned into illness.[9] It was difficult to identify specific causes for these illnesses. The majority of the new epidemiologists concentrated on factors in people's social environments that were associated with modern life and that could be controlled on the level of the individual

[3] On the history of the *Ambulatorien*, see Hansen *et al.* 1981; Tennstedt 1977, esp pp. 150–80. On their model character, see also Grossmann 1995. The organisers of the medical service in the Soviet zone included Paul Konitzer, Barbara von Renthe-Fink, Karl Linser, Alfred Beyer and Maxim Zetkin.

[4] v. Ferber in Blohmke *et al.* (eds) 1977.

[5] Süß in Hockerts (ed.) 1998.

[6] Tennstedt in Blohmke *et al.* (eds) 1976 and 1977.

[7] Literature on the post-war history of academic medicine in West Germany is still relatively rare. Much of the existing literature deals with individual institutions and the ways in which the NS past was addressed. See, for example, Oehler-Klein and Roelcke (eds) 2007. On the GDR, see Ernst 1997.

[8] Aronowitz 1998; Rothstein 2003.

[9] Cf Dawber *et al.* 1962. See Susser 1985 for an insightful account of this shift.

to avoid illness later in life: nutrition (fat and especially cholesterol), other luxuries (smoking), overwork, stress, or lack of exercise.

Many of the pioneers of the risk factor approach were in fact not trained as epidemiologists but had backgrounds in clinical or physiological research. When they attempted to apply the results of laboratory research to humans or to make them relevant for disease prevention, they found themselves working on questions that elsewhere would be associated with social medicine. A good example is Jeremiah Stamler, who started his career with studies on the physiology of nutrition in the late 1940s, investigating the effects of a low-fat diet on a breed of chickens with a tendency to spontaneously develop arteriosclerosis.[10] The equally influential Ancel Keys was a zoologist, marine biologist and physiologist, and creator for the US War Department of the K ration, a food ration that could be easily carried by parachute troops.[11] In the 1950s, together with his wife Margaret, a biochemist, Keys started to study the eating habits of different populations (especially with a view to fat content) and attempting to correlate these with heart disease rates. Thanks to Keys and his followers, the Mediterranean diet and the eating habits of the Japanese are considered as especially healthy, while Finland gained a reputation for eating particularly unhealthily.[12] Besides Stamler and Keys, the organisers of the near-iconic Framingham Heart Study around Thomas Dawber were among the best known pioneers of the risk factor approach.[13]

Framingham, according to the epidemiologist and historian of his discipline, Mervyn Susser 'has become the prototype and model of the cohort study' among epidemiologists in the United States.[14] Dawber and his colleagues, like Keys and Stamler, viewed it as part of their work to publish their results and conclusions not only in scientific journals but also in more widely accessible books and articles directed towards broader audiences, in order to contribute to the prevention of cardiovascular disease by way of education.[15] During a period of intense popular interest in heart disease and in explanations for its apparently increasing visibility, motivated, for example, by the extensive media coverage of President Eisenhower's heart problems, their publications contributed to the popularisation of the risk factor approach.[16]

Robert Aronowitz has argued that the risk factor concept was so attractive, both to experts and non-experts, because it was so flexible, bordering on ambiguity.[17] Risk factors were many things to many people. They provided busy physicians with efficient access to aspects of patients' lifestyles that had long been considered important but for which now there were easily quantifiable markers and increasingly effective drugs.[18] Risk factors represented statistical associations but also provided potential targets for the new

[10] Mitka 2004.
[11] Oransky 2004.
[12] Hoffmann 1979. In British epidemiology the Finnish are in this regard rivalled by the Scottish.
[13] On the history of the Framingham Study, see Oppenheimer 2005; Dawber 1980; Susser 1985.
[14] Susser 1985, p. 157. Examples of other, less iconic studies can be found in 'Measuring the Risk of Coronary Heart Disease: A Symposium', *American Journal of Public Health*, 47 (1957), No 4.
[15] Good examples are Keys and Keys 1960 or Blakeslee and Stamler 1963. The archives of the Framingham Study in Bethesda contain numerous cuttings from newspaper and magazine articles popularizing results of the study, for example Dawber 1965. On 13 January 1961 Ancel Keys even made it onto the cover of *Time Magazine*.
[16] Cf. Messerli *et al.* 2005. Framingham advisor and booster Paul Dudley White was Eisenhower's cardiologist. I am grateful to one of the anonymous reviewers for reminding me of this link.
[17] Aronowitz 1998.
[18] Greene 2007; Timmermann in Timmermann and Anderson (eds) 2006.

products of a thriving pharmaceutical industry.[19] High cholesterol levels or high blood pressure, for example, could not only be 'normalized' by way of lifestyle changes but increasingly also with medication. However, supporters of more holistic understandings of the body, who were not necessarily attracted to the easy fixes provided by these new drugs but concerned about stress and the dangers caused by modern life, could also identify with this approach. Risk factors gave patients the feeling that to some degree they controlled their exposure to heart disease; the concept emphasised individual responsibility for one's health. Traditional concerns of preventive medicine, in contrast, such as housing quality or patterns of poverty were complex and nothing that a general practitioner working in a fee-for-service medical system could address effectively. Furthermore, the increasing prosperity in the industrialized world, which seemed to filter down to all levels of society, made such concerns look like problems of the past. In the 1950s and 1960s heart disease and cancer appeared like diseases related to this new affluence. Some epidemiologists, however, maintained an interest in the effects of inequality and others remained committed to social change.[20]

Aronowitz' book deals with the USA. I am not aiming, in this paper, to complement his and other accounts with a systematic, comparative history of the risk factor approach in the two German states. Rather, I will focus on a number of promoters and critics of the new concepts whom I believe are exemplary, in East Germany in the fields of social hygiene and clinical research and in the West in physiology and social medicine.

Risk Factors, Social Hygiene, and Chronic Disease Epidemiology in the GDR

The new chronic disease epidemiology arrived in the GDR in 1954, still before the first Framingham publications, when Albert Wollenberger, a German émigré physiologist and pharmacologist trained in the USA, was appointed as director of the new laboratory for cardiovascular research at the Academy of Sciences. Wollenberger, a communist, emigrated to the USA when Hitler came to power in 1933. He studied medicine and biology at Harvard and later completed a PhD at the Department of Pharmacology with Fritz Lipmann and Otto Krayer on the biochemistry of heart failure. He left the USA in 1951, when communists were increasingly facing problems.[21] Via Copenhagen, London and Uppsala, he returned to Berlin as Head Assistant at the Humboldt University, having been promised a post as head of the biochemistry department of the Academy's planned institute for cardiovascular research. Wollenberger's scientific career so far—as a physiologist and pharmacologist also interested in the bigger picture—was not fundamentally different from the early careers of Keys and Stamler.[22]

[19] Greene 2007.

[20] The biographies of Mervyn Susser and Zena Stein or Jerry Morris may serve as examples. See articles in the *International Journal of Epidemiology*, 31 (2002), 34–58; especially Smith and Susser 2002 and Oppenheimer and Rosner 2002. On Morris, see Murphy 1999 and articles in the *International Journal of Epidemiology*, 30 (2000), 1141–1199; and 36 (2007), 1165–85. Interestingly, Morris thought that his work on minimum incomes for healthy living was the most underappreciated of his contributions to public health: Oakley 2010. Current social epidemiologists are explicit in their opposition to the individualised risk factor approach: see Bergman and Kawachi (eds) 2000. See also Wilkinson and Marmot 2006.

[21] For the story of another returnee, see Rapoport 1997.

[22] Kutschmar and Hoffmann 1983. See also Timmermann in Berridge and Loughlin (eds) 2005.

In October 1956 the East German medical journal *Das Deutsche Gesundheitswesen* published a special issue with contributions by members of a relatively young working party for cardiovascular disease, the *Arbeitskreis für Kreislauffragen*. The special issue included two essays by Wollenberger, in which he applied ideas and approaches from American chronic disease epidemiology to GDR conditions. The first of these articles dealt with the distribution of cardiovascular disease in the GDR; the second text discussed links between cardiovascular disease and diet.[23] Cardiovascular disease had already appeared on the radar of health policy makers in the GDR by this time. The *Arbeitskreis*, for example, had been launched in response to a proposal by the Ministry of Health. A decision by the Council of Ministers on further developments in public health on 8 July 1954 called for the establishment of an institute for cardiovascular research (besides a so-called Pavlov institute and institutes for hygiene, child protection, sports medicine and blood research).[24]

Furthermore, the Council demanded more rigorous health education efforts: 'The population is still not being mobilised to a sufficient degree for the struggle for improving hygienic conditions and for making their own contributions to securing their health.'[25] In an interesting article, Jens-Uwe Niehoff and Ralf-Raigo Schrader, physician-scholars from East Germany look back critically at health policy in the GDR, characterizing this attitude as a 'Pfadfinderideologie', a boy scout mentality which was easily reconcilable with risk factor concepts.[26] The health system, Niehoff and Schrader argue, focused almost exclusively on citizens' ability to work. They also deplore what they saw as a naive belief among the ruling elite in the predictive power of science.

In the early years of the GDR social hygiene was the dominant science when it came to questions of health policy and preventive medicine. Wollenberger was not a social hygienist and was criticised accordingly in a response to his article. The author, Kurt Winter, was Professor and acting director of the Institute for Social Hygiene at the Humboldt University. He presented himself as part of the tradition established by Alfred Grotjahn.[27] Winter, like Wollenberger, had studied medicine in Germany in the early 1930s and completed his studies in exile. He worked in Switzerland for a few years and in 1937 joined the International Brigades in the Spanish Civil War. Via Paris and Oslo he travelled to Sweden, where he stayed until 1946. He worked as an assistant in the department of cell biology at the Werner Grens Institute in Stockholm and as scientific assistant to Stockholm's medical officer of health. Following his return to Germany he was initially medical officer in the eastern Berlin suburb of Teltow. His brief but steep administrative career culminated in a position as vice president of the central health administration (Zentralverwaltung für Gesundheitswesen) of the Sowjet military administration (SMAD). From 1950 he worked at the Institute for Social Hygiene at the Humboldt University, initially as assistant and lecturer, later as professor.[28]

[23] Wollenberger 1956a and 1956b. See also *7 Jahre Arbeitsstelle für Kreislaufforschung*, Tätigkeitsbericht, Archive of the Berlin-Brandenburgische Akademie der Wissenschaften (hereafter Akademiearchiv), FG 79.

[24] Fischer *et al.* 1979.

[25] Fischer *et al.* 1979, p. 87.

[26] Niehoff and Schrader in Elkeles *et al.* (eds) 1991, p. 54.

[27] Grotjahn was professor of social hygiene from 1920 until his death in 1931, one of the few social democrats in the medical faculty, and member of the *Reichstag*, the German parliament, from 1921 to 1924. See Rabson 1936; Hubenstorf in Treue and Winau (eds) 1987; Weindling 1987.

[28] For Winter's biography, see Schagen and Schleiermacher (eds) 2005, Schorr 1987.

Wollenberger's essay on the distribution of cardiovascular disease was based mainly on data compiled by the central administration for statistics (Staatliche Zentralverwaltung für Statistik), the planning commission (Staatliche Plankommission), the statistical department of the Greater Berlin council (Abteilung Statistik beim Magistrat von Gross-Berlin) and the department of statistics of the social insurance administration (Referat Statistik der Versicherungsanstalt Berlin). The bibliography lists only two references, one of them a talk by Ancel Keys in 1954. Wollenberger argued that in the GDR, as in other developed countries, non-communicable and chronic illnesses such as cancer or cardiovascular disease had replaced infections as the main causes of death and disability, and the trend pointed to further increases. However, as the GDR did not publish official death statistics and as information on the health of the population was incomplete, he suggested, these developments were insufficiently recognised and acknowledged by the medical profession.[29] In the second essay that Wollenberger contributed to the special issue, on the role of diet in the aetiology of cardiovascular disease, he again referred to Keys, arguing that 'the still widely held attitude' that cardiovascular problems were inevitable consequences of ageing could no longer be scientifically defended.[30] Especially arteriosclerosis and hypertension had their roots in the environment, he argued, and the most important environmental factor in this context was diet. In 1955 Wollenberger had undertaken a series of animal experiments, investigating the effects of a diet rich in cholesterol on roosters.[31] Chickens were also the experimental animals of choice for Jeremiah Stamler before he turned to epidemiological studies.[32] In his article, Wollenberger did not refer to his own experiments but above all to American publications. Abundance and not deprivation was at the centre of the problem, he argued, and the main suspects were fat and salt. He cited a 1952 publication by Louis Dublin and Herbert Marks—whose studies also informed the Framingham organisers—based on Metropolitan Life Insurance data. These data had shown, he argued, that overweight people had a shorter life expectancy and that this was predominantly due to a tendency to develop cardiovascular illnesses that ended in death.[33] The same statistics showed that losing weight led to increased life expectancy. For the purpose of disease prevention, a general control of calorie and fat intake as had been proposed by Keys, he suggested, was 'not at all unjustified'.[34]

Winter wrote in his response that he considered Wollenberger's concern for the 'social hygienic problems' around cardiovascular disease in the GDR very 'laudable' (verdienstvoll).[35] However, some of the questions raised by Wollenberger needed to be discussed further. Winter questioned, for example, whether the increase in mortality and morbidity that Wollenberger found in the statistics represented a real increase. It could also result from changed mortality patterns and changed diagnostic practices. Winter did not think the data were reliable enough to allow the broad conclusions that Wollenberger had drawn. 'Only a very careful and detailed evaluation of the figures, [an exercise] in which we are currently engaged', he suggested, 'will show if the questions raised [by Wollenberger] can be answered with sufficient confidence'.[36] In 1962 Winter

[29] Wollenberger 1956a, p. 1401.
[30] Wollenberger 1956b.
[31] Bericht über Cholesterol-Versuche mit Hähnen, 1.8.1957, Akademiearchiv, AKL 57.
[32] Mitka 2004.
[33] Wollenberger 1956b.
[34] Wollenberger 1956b, p. 1415.
[35] Winter 1957, p. 327.
[36] Winter 1957, p. 331.

published a slim volume on *The Significance of Cardiovascular Disease*, again advising readers to be careful when dealing with statistics.[37]

In his response to Winter, Wollenberger wrote that he was pleased that his compilation of mortality and morbidity data had inspired the social hygienists to look at cardiovascular disease.[38] But he insisted that his original conclusion was valid: the increase was real and likely to be related to diet. After this brief excursion in the 1950s, Wollenberger, unlike Keys in the USA, never again turned to epidemiology, dedicating his research exclusively to the cell biology of the heart. He published his results predominantly in English, gaining an international reputation, especially in the West. Wollenberger was one of the founders and the second president (1973–76) of the International Society for Heart Research. His profile in the GDR, in contrast, was not particularly high until, in the 1970s, he acquired some fame as the public face of the state-sponsored GDR jogging movement. Other researchers based at the Academy of Science had considerably higher public profiles.[39] Questions of public health were dealt with outside the Academy, initially mostly by the social hygienists. Social hygiene, however, increasingly lost its dominant role in matters of health policy in the GDR in the late 1960s.[40] It was replaced by a new, clinically oriented epidemiology of chronic disease modelled on American examples.

The turn towards the new chronic disease epidemiology began around the mid 1960s with a series of population studies.[41] Some of these studies used the dispensary system set up following the 1954 Council of Ministers decree in order to recruit study subjects. There were special dispensaries for the treatment of hypertension, for example, and research was included in their remit.[42] A prospective study on cardiovascular risk factors was organised by Siegfried Böthig and a team that among others included Lothar Heinemann in the Mitte district of Berlin in 1968.[43] Böthig and his colleagues invited 622 men between 50 and 54 to take part in the study, two-thirds of the men in this age group in the district, selected from the population register. These epidemiological studies were organised by clinical researchers rather than social hygienists. This was a characteristic they shared with the Framingham Study, whose director, Thomas Dawber (an internist) viewed epidemiology as 'clinical observation on a community level'.[44] Dawber considered the involvement of social scientists unnecessary, and the new chronic disease epidemiologists in the GDR did not feel they needed the help of social hygienists for the organisation of their studies.

A further decisive factor favouring the new approaches in the GDR was membership of the World Health Organisation (WHO) in 1973. The GDR had sent observers to Geneva since the early 1960s, but now East German representatives could play a key part in the activities of the WHO in Europe. According to Niehoff, the keenness of the GDR government to gain international recognition led to a tendency to always behave like model

[37] Winter 1962.

[38] Wollenberger 1957, p. 781.

[39] One example is Rudolf Baumann, director of the Pavlov-Institute, which merged with Wollenberger's institute in the Academy reform in the early 1970s. Cf. Timmermann in Berridge and Loughlin (eds) 2005.

[40] Cf Niehoff 1999; Niehoff in Roeßinger and Merk (eds) 1998; Niehoff and Schrader in Elkeles *et al.* (eds) 1991.

[41] Cf Straube 1967; Knappe *et al.* 1971; Böthig *et al.* 1972.

[42] Straube 1967; Weissel 1967.

[43] Böthig *et al.* 1970.

[44] Oppenheimer 2005, p. 608. See also Aronowitz 1998, p. 135.

pupils (Musterschüler) when involved in international projects such as those organised under the umbrella of the WHO.[45] Both the Berlin Mitte study and a prospective hypertension study organised by a group at the Medical Academy Erfurt, also in 1968, cited WHO guidelines as the main sources of their methodologies.[46] GDR representatives were active participants in the WHO MONICA heart study (MONItoring Trend and Determinants of CArdiovascular Diseases, 1979–2002), and Böthig was for some time based at the WHO headquarters in Geneva.[47]

Most of the new epidemiologists were former students or assistants of Harald Dutz, an influential clinician, cardiologist and nephrologist with a long-standing interest in hypertension based initially at Rostock and later at the Charité.[48] Following reform of the biomedical institutes of the Academy of Sciences which included the establishment of a Central Institute for Cardiovascular Research in 1972, the new chronic disease epidemiology gained a foothold at the Academy.[49] The whole Central Institute was increasingly more clinically-oriented. Epidemiology was represented by Hans Dieter Faulhaber and Lothar Heinemann. Faulhaber had originally trained as a pharmacologist and worked with Dutz at the Charité, specialising in hypertension. After a second period specialising in clinical medicine (Facharztausbildung) he moved to Buch, where he was promoted relatively quickly to director of the policlinic and deputy director of the institute. He established an epidemiology working group, coordinating among other projects a hypertension control study in the Berlin borough of Pankow (in collaboration with the WHO). The hypertension programme under Faulhaber was dedicated above all to the early detection and effective long-term management—or 'secondary prevention [sekundäre Prophylaxe]—of hypertension'; prevention by way of intervention at the level of the individual.[50] The Pankow study was designed to evaluate the effectiveness of treatment without medication, placing a strong emphasis on counselling and lifestyle change, which was partly a response to the need to cut the expenses of importing drugs from the West.

The move towards US-style chronic disease epidemiology had its critics. Winter and his colleagues and students remained sceptical about this approach. Their scepticism is evident, for example, in a joint-authored, critical paper on the epidemiology of arteriosclerosis published in 1967.[51] Winter and his co-authors wrote that they found an article by Hinkle on 'Some social and biological correlates of coronary heart disease' in *Social Science and Medicine* interesting above all because 'it does not tell us anything new'.[52] They continued to warn of careless conclusions based on unreliable cause-of-death statistics and badly defined diagnostic categories. Well-organised epidemiological studies, of course, unlike most of the contemporary research on risk factors, they suggested, would have to be welcomed.

Jens-Uwe Niehoff was an assistant at Winter's institute at the Humboldt University in 1978 when he criticised the apparent move to the risk factor approach in GDR medicine

[45] Niehoff 1999, p. 113.
[46] Knappe *et al.* 1971.
[47] Cf Tunstall-Pedoe 2003.
[48] Cf. Dutz 1951. Dutz actively read US journals: Dutz 1954.
[49] Cf Timmermann in Timmermann and Anderson (eds) 2005. On the Academy reforms, see also Reindl in Ritter *et al.* (eds) 1999; Bielka 1997.
[50] Cf Faulhaber and Manke 1981.
[51] Winter *et al.* 1967.
[52] Winter *et al.* 1967, p. 19.

in a two-part article published in *Zeitschrift für ärztliche Fortbildung*.[53] Niehoff remembers that he received more than 250 requests for reprints, but he was also faced with a reprimand from the minister of health and with hostile reactions, as he put it in an interview with the author, from 'the cardiovascular people'. In the end, he felt, his criticism was futile: 'If you were against risk factors in 1978, you stood completely against the mainstream.'[54] Niehoff worried about the political implications of risk factor medicine and what he saw as attempts by a medical elite close to the government, to install a new surveillance regime around everyday public health issues, making people personally responsible for their health problems.[55] In his article, however, he concentrated on epistemological arguments. Risk factors had no proper theoretical foundation, Niehoff wrote. They suggested causal connections where these could not be proven and thus were intellectually dishonest.[56]

Many promoters of the risk factor concept were aware of the fuzziness which Niehoff interpreted as intellectual dishonesty. Risk factors to them were a useful heuristic tool which made it possible to discuss statistical correlations for which causal explanations were unclear. Not all appeared to be aware, however, and some took advantage of the fuzziness. The West German hypertension expert Klaus Dietrich Bock, for example, wrote in 1982 that risk factors were the 'main or contributing causes of disease and disease complications'.[57] And of course, risk factors had so much explanatory power partly because the media treated them as if they were causes of disease. As most risk factors were related to human behaviour they were easy to relate to and invest with meaning, and they resonated with traditional approaches to disease that associated illness with moral failings: health could be secured by ascetic behaviour; a diet low in fat and sugar, exercise, and the denial of luxuries. This way of thinking sat uneasily with Winter (and Niehoff), to whom health included the ability to enjoy. But it resonated with the reality of an economy that struggled with the desire of its citizens to gain access to the increasing abundance of consumer goods they observed on West German television.[58] To some, in fact, the increase in heart disease in the GDR may have been a secret source of pride, did it not show that the government managed to maintain a level of affluence that was comparable to the West?[59]

What were the implications of the work by the new epidemiologists such as Böthig, Faulhaber or Heinemann for the dominant models in GDR preventive medicine? In a report by Heinemann, published in 1987 in the popular science magazine of the Academy of Sciences, *Spectrum*, the aspects of the social environment which social hygienists were interested in, do not feature at all. Heinemann, originally a clinician and cardiologist who trained at the Charité with Dutz, also held qualifications in psychology and had worked with Böthig on the Berlin–Mitte study. From 1982 to 1984 he coordinated the WHO MONICA programme in the GDR and participated in several

[53] Niehoff 1978.
[54] Interview with Jens-Uwe Niehoff, Altwustrow, 7 August 2001.
[55] For a theoretical discussion of 'surveillance medicine' in the West, see Armstrong 1995.
[56] Niehoff 1978.
[57] In German: 'Haupt- oder Teilursachen von Krankheiten und Krankheitskomplikationen'; Bock in Bock and Hofmann (eds) 1982, p. 7.
[58] Cf Wolle 1999.
[59] This is implicitly suggested, for example, in the introductory paragraph to Heine 1969.

other WHO projects.[60] Heinemann explained that in the GDR, as in all industrialised countries, chronic illnesses caused increasing problems. The responsibility for preventing these rested with individual cititzens, who had to be educated accordingly.[61] Heinemann's text contains a good deal of GDR typical terminology, but the general approach was the same as in the West. Indeed, after the fall of the Berlin Wall and the end of the GDR, Heinemann experienced a relatively soft landing in the capitalist world. Today he is Managing Director of the privately owned Center for Epidemiology and Health Research (Zentrum für Epidemiologie und Gesundheitsforschung) in Berlin, running epidemiological studies and clinical trials both for public bodies and private companies.[62]

'Social medicine is not socialist medicine'—Risk Factors in the Federal Republic

In contrast with the GDR, social hygiene played a marginal role in the West German Federal Republic and was largely forgotten after the end of World War II.[63] For Hans Schaefer, the co-editor of a substantial, three-volume handbook of social medicine and director of Heidelberg University's institute for social medicine and industrial hygiene, social hygiene played no role in the history of the subject. The roots of social medicine, as he understood it, were American. The history of this subject in Germany was short, he stated: 'Sociological work in a narrow sense hardly existed before 1960.'[64] Rather than mentioning social hygiene, in his memoirs he positions himself as a follower of Talcott Parsons' approaches to sociology. How, then, did a physiologist turn into an epidemiologist and co-organiser of one of West Germany's first risk factor studies?

The physiologist Schaefer was acting director of the Kerckhoff Institute for cardiovascular research in Bad Nauheim until 1951, when he was appointed professor of physiology at Heidelberg University. In 1960 the regional parliament of the state Baden-Württemberg invited him to develop plans for an institute of industrial hygiene (Arbeitsmedizin). They approached Schaefer because of his broad interests and because he had acquired a reputation for approaching medicine in more holistic ways than others. Schaefer argued that social medicine was more important than industrial hygiene, but, in contrast with the latter, did not yet have an institutional home in Germany.[65] Teaching and research on disease prevention was in the hands of the hygienists, but they did not feel that chronic illnesses were part of their remit. He would never forget, Schaefer writes in his memoirs, how during a conference sponsored by the Deutsche Forschungsgemeinschaft (DFG, West Germany's main science funding agency) around 1970, two prominent representatives of the discipline of hygiene refused to associate epidemiology with anything other than infectious disease. They left the room, annoyed, he remembers, when he addressed the progress of chronic disease epidemiology in the United States.[66]

[60] Cf Heinemann 1987.
[61] Heinemann 1987.
[62] Cf ZEG Website, http://www.zeg-berlin.de/, accessed on 9 June 2009.
[63] An exception was Hans Harmsen, professor of general and social hygiene in Hamburg, who had already gained a profile as a social (and racial) hygienist before 1945. Cf Schleiermacher in Fisch and Rudloff (eds) 2004.
[64] Schaefer 1986, p. 263.
[65] Ibid.
[66] Schaefer 1986, p. 227.

The Heidelberg Institute was founded in 1962, with Schaefer as director and Maria Blohmke as his associate. Schaefer and Blohmke also co-edited the monumental three-volume *Handbook of Social Medicine* and she succeeded him as chair in 1975.[67] Social medicine to Schaefer was an 'ecological subject' and he was above all interested in physiological mechanisms through which environmental influences made people ill. He was less interested in statistics. Even where statistical associations could be clearly demonstrated, he argued, one should not neglect the search for causal (read: physiological) explanations. The environment had effects on people's emotions, they were mediated by hormones and the autonomic nervous system, and these mechanisms should be identified. During a visit to North America in the 1950s, Schaefer had been introduced to Hans Selye's stress theories and he had become interested in the regulation of the heart and the role of psychosocial stress as a cause of cardiovascular disease. He counted Selye, besides Talcott Parsons, among the main influences that informed his approach to social medicine. However, he also referred to such icons of alternative medicine as the nineteenth-century Bavarian priest and promoter of hydrotherapy, Sebastian Kneipp, the psychiatrist Erich Fromm and the environmental biologist Konrad Lorenz.[68]

In the field of preventive medicine the Federal Republic drew largely on traditions and values associated with the educated middle classes (and occasionally gentrified representatives of alternative traditions, such as Kneipp), and unlike the GDR shunned organisational or intellectual alternatives to traditional models of medical practice.[69] The Rhinelander Schaefer was a practising catholic and this shaped his value system. He argued for a close dialogue between church and science, but also supported the movement against nuclear weapons and pleaded for an open debate with Marxism. By the early 1960s he was known, according to his Heidelberg colleague and contemporary, the medical historian Heinrich Schipperges, as 'the conscience of German medicine'.[70] Outside Heidelberg, social medicine looked to other models, but usually drawing on German educated middle class traditions rather than, for example, the focus on class and social environment found in post-war British social medicine.[71] Psychological explanations were central, and sometimes ideas developed by the followers of Rudolf Steiner. Manfred Pflanz, for example, professor of epidemiology and social medicine at the Medical Academy of Hannover from 1967 to 1980 and besides Schaefer probably the most important representative of the subject at the time, had studied psychology in addition to medicine, and he had also undergone a Freudian psychoanalysis. In 1961 he had completed his *Habilitation* in internal and psychosomatic medicine at the University of Giessen with Thure von Uexküll, a well-known promoter of holistic ideas, who was also a friend of Schaefer.[72]

Maria Blohmke based her approach to social medicine on the philosophical anthropology of Arnold Gehlen, who characterized human beings as badly adapted animals with shortcomings (Mängelwesen). As human beings had lost their natural instincts, they could no longer adapt to nature, and had to compensate for this by

[67] Blohmke *et al.* (eds) 1976.
[68] Schaefer 1986, p. 268.
[69] Cf Hansen *et al.* 1981.
[70] Schipperges in Schipperges *et al.* (eds) 1986, pp. 127–38, S. 127. This essay is not the right place for a discussion of Schaefer's involvment in military research before 1945.
[71] Cf. Murphy 1999.
[72] Short biography in Schagen and Schleiermacher (eds) 2005.

adapting their environment, by creating culture. But human beings also lacked natural mechanisms that helped them to assess environmental stimuli adequately, and according to Blohmke's reading of Gehlen this was at the root of frequent overstimulation. She suggested, with reference to Gehlen and the sociologist Alfred Weber, that the Industrial Revolution, especially the increasing industrialisation of white collar work and the resulting alienation triggered physiological processes that caused the increase in heart disease.[73] Heart disease to her was a disease of managers.

Blohmke was the daughter of a medical professor—an ear, nose and throat specialist. She had trained in internal medicine but found in the 1950s that, after a serious spell of tuberculosis, she was unable to continue practising clinical medicine. While she was recovering, she discovered an interest in the humanities. In 1955 she accepted a job offer at the Hoechst chemical factory near Frankfurt on Main, first as medical advisor to the Board of Directors and later as directorial assistant in the pharmaceuticals division. During her time at Hoechst she acquired experience working with mainframe computers, which would be useful for her later research. In 1958 she accepted a position at the headquarters of the DFG in Bonn. Schaefer met her during a meeting of the DFG working group for cardiovascular research and offered her a job at the new institute he was about to set up in Heidelberg. In an interview with the author in 2001 Blohmke emphasised repeatedly how important she thought computers were for chronic disease epidemiology and by implication for social medicine, and how her time at Hoechst had prepared her for this. She read the Framingham publications and visited the USA in 1964. Epidemiological work to her was predominantly a technical challenge, and she was less interested in social implications. One learned most, she mused in 2001, from people who could read computer printouts. In Heidelberg she arranged access to a computer at the Institute of Theoretical Physics, at night, when the physicists were not using it. She appointed a physicist and a sociologist who had studied with Ralf Dahrendorf. In 1966 she completed her *Habilitation* in industrial physiology (Arbeitsphysiologie); it would have been impossible, she thought, to get the medical faculty to agree to the label of social medicine.

In 1967 Schaefer and Blohmke were awarded a grant from the Volkswagen Foundation worth half a million Deutschmark, to organize their own population study (known as the Heidelberg study) and research the role of psychological and social factors in the aetiology of coronary heart disease. They were supported by the Heidelberg city council, whose employees were invited to participate in the study. Schaefer admitted in his memoirs that at this time they did not have the methodological tools to achieve their goals and did not know the international literature well enough.[74] However, according to Schaefer, 'this was the first chance in Germany to learn epidemiology' (he was obviously not aware of contemporary developments on the other side of the Iron Curtain).[75] Results along with philosophical reflections, aetiological assumptions and conclusions were published ten years later in a book, the first monograph in German, they claimed, that attempted a thorough analysis of how the social environment influences coronary heart disease.[76]

In their book, Blohmke and Schaefer treated risk factors as more than just heuristic tools. They developed their own, slightly idiosyncratic terminology. Risk factors were

[73] Blohmke in Blohmke and Schaefer (eds) 1966.
[74] Schaefer 1986, p. 304.
[75] Ibid.
[76] Ibid; Schaefer and Blohmke 1977.

defined as 'such and only such processes that influenced human beings so that they caused [hervorrufen] disease (factor from [the latin verb] facere!)'.[77] In addition, there were 'risk indicators' which could not always be distinguished clearly from risk factors. For recurrent 'bundles of risk factors … common to certain life situations' the authors coined the term 'risk situations'.[78] As not every human responded to environmental influences in the same ways, they suggested using the term 'risk personality' to describe individual combinations of risk factors, indicators and situations.[79] For their definition of risk, they drew on what Schaefer as a scholar of the classics identified as the latin roots of the term, *risicare*, which meant to circumnavigate a reef. Risk was an invisible danger, much like a reef under the surface, which could be avoided as a reef could be circumnavigated. The recognition of risks therefore was the foundation of illness prevention.[80]

Attitudes towards social medicine and the political context in which it operated changed in West Germany in the early 1970s, partly in response to broader changes in academia and society. Sociology became more politically charged, and it was increasingly associated with the left. This development also appears to have found its reflection in medical sociology. The relationship between Blohmke and Schaefer turned sour around this time, and she applied for a number of chairs. She told the author, however, that whenever she held one of the customary lectures that were part of the application procedure 'there were always the same group of left-wingers sitting in the first row'.[81] In 1975, when she was offered chairs at the universities of Mainz and Giessen, the Heidelberg dean argued for persuading the politically conservative Blohmke to stay, to prevent a 'left-winger' from coming in.[82] Such rifts had their roots partly in the political realities of the Federal Republic after 1968 and in distrust towards established authorities, but they also developed around more specific issues such as the radical attack on scientific medicine by critics such as Ivan Illich.[83] And the new critics on the political left also took issue with the rise of the risk factor approach.

A group of doctors and social scientists associated with the annual publication *Jahrbuch für Kritische Medizin* were among the most vocal (and increasingly well-informed) critics of the risk factor concept and the consequences of its application in the Federal Republic. The *Jahrbuch* was published by the left-wing *Argument* publishing house. It had its roots in a loose series of special issues of the journal *Das Argument*, published from 1970 under the title *Kritik der bürgerlichen Medizin* [Critique of Bourgois Medicine]. Especially interested in risk factors among the *Jahrbuch* authors were Dieter Borgers and Heinz Harald Abholz (both now affiliated with the Department of General Practice at the Medical School of Düsseldorf University), along with Rolf Rosenbrock (today at the Wissenschaftszentrum Berlin).[84] All three were born around 1945, socialised academically in the 1960s, and associated with the Zentrum für soziale Medizin at Freie Universität Berlin in the 1970s, which was a focal point for controversies over politics in medicine. Borgers and Abholz trained in medicine while Rosenbock's background was in sociology. In their

[77] Schaefer and Blohmke 1977, p. 18.
[78] Ibid.
[79] While publications on the Type A hypothesis were among the literature cited, they aimed to develop their own model.
[80] Schaefer and Blohmke 1977.
[81] Interview with Maria Blohmke, Munich, 18 March 2001.
[82] Ibid.
[83] Illich 1975.
[84] See for example Abholz *et al.* (eds) 1982.

publications on the subject they addressed the way in which the risk factor concept appeared to medicalise people who did not necessarily feel sick when physiological parameters such as blood pressure or blood cholesterol went above a more or less arbitrary threshold. As a result, as Borgers especially argued, a large proportion of the population were becoming subjects of medical surveillance, declared potentially sick and in need of treatment.[85] The risk factor approach, as he pointed out, made treatment and prevention merge into one another. The consequence was that in modern industrial countries the treatment of risk factors was more common than the treatment of manifest illnesses. Borgers argued that epidemiological evidence did not necessarily support the risk factor approach, and that prevention strategies building on this approach were insufficiently evaluated. Borgers' arguments are fairly commonsense, but they did appear to challenge the judgement of mainstream experts. Three decades later the members of the group around the *Jahrbuch*, whose openly political approach to medicine in the 1970s alarmed conservative members of older generations such as Schaefer and Blohmke, have themselves become part of the mainstream. They are today widely recognized as experts in epidemiology and preventive medicine.

Conclusion

Prevention by treatment, the approach criticized by Borgers and his colleagues, has little in common with the approaches favoured by social hygienists focusing on improving social environments. But practices supported by the risk factor approach had precursors in the history of medicine and health in Germany. There are parallels, for example, with health practices that originated in the lifestyle reform movement and with nineteenth- and early twentieth-century interpretations of folk medicine.[86] Ascetic lifestyle, healthy food, herbal tonics which were taken to strengthen the heart, or cold water treatments that were meant to strengthen the resistance to illness, appealed to similar sensibilities as some of the arguments brought forward by promoters of the risk factor approach. To many lifestyle reformers, too, self discipline and an ascetic life was seen as central to preventing illness, and the individual was responsible for his or her own health.[87]

Criticism of the risk factor approach in East and West Germany focused on different issues, specific to the different contexts, but there were also significant overlaps. A central point of criticism in the West was medicalisation and the resulting surveillance. To the anti-authoritarian members of the 1968 generation, risk factors represented one more tool in the armamentarium of a potentially oppressive state.[88] In the GDR state and medicine were much more closely enmeshed, but criticisms of risk factor medicine were directed predominantly against its scientific claims. The background to this, as I have argued, was a struggle between social hygienists and clinicians, but also the need to be more careful with one's criticism. To Jens-Uwe Niehoff, as for the group around the *Jahrbuch* in the West, worries about the use of risk factors to both justify surveillance and assign blame for health problems to individual citizens, and thus release the state from its responsibility, formed a significant political motivation for criticism, but in his

[85] Borgers in Abholz *et al.* (eds) 1982. Their concerns were similar to Niehoff's.
[86] Cf Timmermann 2001.
[87] See also Hau 2003.
[88] Suspicion was widespread in West Germany about data collection exercises sanctioned by the state. There was considerable resistance, for example, to the 1987 census.

1978 article Niehoff predominantly attacked what he saw as the intellectual dishonesty of the concept. The authorities in the East as well as the West, however, usually followed the recommendations of the 'real' doctors, the clinician-epidemiologists embracing the risk factor model, rather than (sometimes) maverick critics and social scientists. The former offered practical solutions that could be easily understood and resonated with dominant medical paradigms, while the latter criticised what was generally viewed as progress and fielded unpopular suggestions to slow down and rethink.

The risk factor approach began its rise as a heuristic tool and became problematic when its findings were adopted uncritically and invested with deeper meanings. Ultimately risk factors were interpreted as recommendations for how and how not to live one's life. In both East and West Germany the risk factor approach became part of a health model where responsibility for illness and health was lodged increasingly firmly with individuals and their lifestyles. Heart disease was associated with prosperity, stress and ultimately success, the side effects of the post-war economic miracle, which people were expected to tackle by adapting their lives (or taking preventive medication such as antihypertensive or cholesterol-lowering drugs). If they did not do this and continued to smoke or overeat, it was their own fault when they fell ill. Alas, a growing number of studies demonstrate that even in the affluent West there continue to be strong associations between social deprivation and illness.[89]

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Bibliography

Primary sources

Archive of the Berlin-Brandenburgische Akademie der Wissenschaften, AKL 57 and FG 79.

Interviews with Maria Blohmke, Munich, 18 March 2001; Hans-Dieter Faulhaber, Berlin, 9 August 2001; Jens-Uwe Niehoff, Altwustrow, 7 August 2001.

Email correspondence, Heinz-Harald Abholz, 15 May 2009.

Abholz H.-H., Borgers D., Karmaus W. and Korporal J. (eds) 1982, *Risikofaktorenmedizin: Konzept und Kontroverse*, Berlin & New York: de Gruyter.

Blakeslee A. and Stamler J. 1963, *Your Heart Has Nine Lives: 9 Steps to Heart Health*, Englewood Cliffs, NJ: Prentice-Hall.

Blohmke M. 1966, 'Sozialmedizin', in Blohmke M. and Schaefer H. (eds), *Erfolge und Grenzen der modernen Medizin*, Frankfurt: Fischer Bücherei, 236–53.

Blohmke M., v. Ferber C., Kisker K. P. and Schaefer H. (eds) 1976, *Handbuch der Sozialmedizin*, Stuttgart: Enke.

Bock K. D. 1982, 'Einführung', in Bock K.D. and Hofmann L. (eds), *Risikofaktoren-Medizin: Fortschritt oder Irrweg? Ein interdisziplinäres Gespräch* (Braunschweig/Wiesbaden: Vieweg & Sohn, 1982), 7–10.

[89]Cf Wilkinson and Marmot 2006.

Borgers D. 1982, 'Risikofaktorenmedizin und Primärprävention beim milden Bluthochdruck', in Abholz H.-H., Borgers D., Karmaus W. and Korporal J. (eds), *Risikofaktorenmedizin: Konzept und Kontroverse*, Berlin & New York: de Gruyter, 105–18.

Böthig S., Barth W. and Hutzelmann H. 1970, 'Programm und Organisation der epidemiologischen Herz-Kreislauf-Studie Berlin-Mitte', *Das deutsche Gesundheitswesen*, 25, 1203–7.

Böthig S., Knappe J., Heine H. and Anders G. 1972, 'Epidemiologie der Herz-Kreislauf-Krankheiten in der Deutschen Demokratischen Republik', *Das deutsche Gesundheitswesen*, 27, 823–9.

Dawber T. R. 1965, 'Heart Attack—What's the Risk?', *Today's Health*, August.

Dawber T. R. 1980, *The Framingham Study: The Epidemiology of Atherosclerotic Disease*, Cambridge, MA: Harvard University Press.

Dawber T. R., Kannel W. B., Revotskie N. and Kagan A. 1962, 'The Epidemiology of Coronary Heart Disease—The Framingham Enquiry', *Proceedings of the Royal Society of Medicine*, 55, 265–71.

Dutz H. 1951, 'Neuere Auffassungen über Pathogenese und Therapie der Hypertonie', *Das deutsche Gesundheitswesen*, 6, 725–30.

Dutz H. 1954, 'Journal of the American Medical Association, Nr. 14–18 (August) 1953; Nr. 1–4 (September) 1953', *Das deutsche Gesundheitswesen*, 9, 322–4, 451–2.

Faulhaber H.-D. and Manke E. 1981, 'Gegen den hohen Blutdruck', *Spectrum*, 12, 8–9.

Fischer E., Rohland L. and Tutzke D. 1979, *Für das Wohl des Menschen: 30 Jahre Gesundheitswesen der Deutschen Demokratischen Republik*, Berlin: VEB Verlag Volk und Gesundheit.

Heine H. 1969, 'Die Bekämpfung der Herz-Kreislauf-Krankheiten in der Deutschen Demokratischen Republik', *Das deutsche Gesundheitswesen*, 24, 1834–42.

Heinemann L. 1987, 'Gesundheit: Auf dem Weg zur Trendwende', *Spectrum*, 18, 1–3.

Knappe J., Strube G., Dück K.-D. and Knappe G. 1971, 'Epidemiologische Untersuchungen zur Prävalenz der Hypertonie in Abhängigkeit von sogenannten Risikofaktoren', *Das deutsche Gesundheitswesen*, 26, 2212–5.

Niehoff J.-U. 1978, 'Risikofaktoren—Risikofaktorentheorie—Risikokonzept: Theoretische Voraussetzungen und Schwierigkeiten bei der Interpretation', *Zeitschrift für ärztliche Fortbildung*, 72, 84–9, 145–9.

Schaefer H. 1986, *Erkenntnisse und Bekenntnisse eines Wissenschaftlers*, Heidelberg: Verlag für Medizin Dr. Ewald Fischer.

Schaefer H. and Blohmke M. 1977, *Herzkrank durch Psychosozialen Stress*, Heidelberg: Dr. Alfred Hüthig Verlag.

Straube K.-H. 1967, 'Ergebnisse der epidemiologischen Forschung im Dienste der Dispensairebetreuung Koronarkranker und Koronargefährdeter', *Das deutsche Gesundheitswesen*, 22, 1690–6.

Weissel M. 1967, 'Hypertoniedispensaire. 1. Mitteilung: Organisatorische Maßnahmen in der ambulanten medizinischen Einzeleinrichtung zur Betreuung der Hypertoniker', *Das deutsche Gesundheitswesen*, 22, 2220–5.

Winter K. 1957, 'Verbreitung der Herz- und Kreislaufkrankheiten in der DDR. Einige Bemerkungen zu dem Artikel von A. Wollenberger, veröffentlicht in Heft 42/1956 dieser Zeitschrift', *Das deutsche Gesundheitswesen*, 12, 327–31.

Winter K. 1962, *Die Bedeutung der Herz-Kreislauf-Erkrankungen für Sterblichkeit, Arbeitsunfähigkeit und Invalidität*, Berlin: VEB Verlag Volk und Gesundheit.

Winter K. and Hesselbarth W. 1963, 'Zur "erschreckenden Zunahme des Koronartodes". Stellungnahme zur Arbeit von D. Ziegenspeck: "Über Probleme der Prophylaxe chronischer Tabakschäden", veröffentlicht in Heft 11/1963 dieser Zeitschrift', *Das deutsche Gesundheitswesen*, 18, 1791–2.

Winter K., Lemke K. and Kreuz B. 1967, 'Zur Epidemiologie der Arteriosklerose in der DDR', *Berliner Gesellschaft für Innere Medizin*, 5, 19–22.

Wollenberger A. 1956*a*, 'Verbreitung der Herz- und Kreislaufkrankheiten in der Deutschen Demokratischen Republik', *Das deutsche Gesundheitswesen*, 11, 1401–4.

Wollenberger A. 1956*b*, 'Kreislaufkrankheiten und Ernährung', *Das deutsche Gesundheitswesen*, 11, 1410–6.

Wollenberger A. 1957, 'Verbreitung der Herz- und Kreislaufkrankheiten in der Deutschen Demokratischen Republik. Schlußwort', *Das deutsche Gesundheitswesen*, 12, 781–2.

Secondary sources

Armstrong D. 1995, 'The Rise of Surveillance Medicine', *Sociology of Health and Illness*, 17, 393–404.

Aronowitz R. A. 1998, *Making Sense of Illness: Science, Society, and Disease*, Cambridge: Cambridge University Press.

Bergman L. F. and Kawachi I. (eds) 2000, *Social Epidemiology*, New York: Oxford University Press.

Bielka H. 1997, *Die Medizinisch-Biologischen Institute Berlin-Buch: Beiträge Zur Geschichte*, Berlin: Springer.

Ernst A.-S. 1997, *'Die beste Prophylaxe ist der Sozialismus': Ärzte und medizinische Hochschullehrer in der SBZ/DDR 1945–1961*, Münster: Waxmann.

v. Ferber C. 1977, 'Gesundheitsvorsorge im Systemvergleich Bundesrepublik-DDR', in Blohmke M., v. Ferber C., Kisker K. P. and Schaefer H. (eds), *Handbuch der Sozialmedizin. Band II: Epidemiologie und präventive Medizin*, Stuttgart: Ferdinand Enke, 506–32.

Greene J. A. 2007, *Prescribing by Numbers: Drugs and the Definition of Disease*, Baltimore: Johns Hopkins University Press.

Grossmann A. 1995, *Reforming Sex. The German Movement for Birth Control and Abortion Reform 1920–1950*, Oxford: Oxford University Press.

Hansen E., Heisig M., Leibfried S., Tennstedt F., Klein P., Machtan L., Milles D. and Müller R. 1981, *Seit über einem Jahrhundert… : Verschüttete Alternativen in der Sozialpolitik*, Düsseldorf: Bund-Verlag.

Hau M. 2003, *The Cult of Health and Beauty in Germany: A Social History, 1890–1930*, Chicago: University of Chicago Press.

Hoffmann W. 1979, 'Meet Monsieur Cholesterol', *University of Minnesota Update*, Winter 1979, accessed online at http://mbbnet.umn.edu/hoff/hoff_ak.html, on 9 June 2009.

Hubenstorf M., 1987, 'Alfred Grotjahn', in Treue W. and Winau R. (eds), *Berlinische Lebensbilder: Mediziner*, Berlin: Colloquium Verlag, 337–58.

Hubenstorf M. 1989, '"Deutsche Landärzte an die Front!" Ärztliche Standespolitik zwischen Liberalismus und Nationalsozialismus', in Pross C. and Aly G. (eds), *Der Wert des Menschen: Medizin in Deutschland 1918–1945*, Berlin: Edition Hentrich, 200–23.

Illich I. 1975, *Medical Nemesis: The Expropriation of Health*, London: Calder & Boyars.

Keys A. and Keys M. 1960, *Eat Well and Stay Well*, London: Hodder and Stoughton.

Kutschmar S. and Hoffmann U. 1983, 'Erleben, Erfahren, Erkennen: Akademiemitglied Albert Wollenberger erinnert sich', *Spectrum*, 14, 14–7.

Messerli F. H., Messerli A. W. and Lüscher T. F. 2005, 'Eisenhower's Billion-Dollar Heart Attack—50 Years Later', *New England Journal of Medicine*, 353, 1205–7.

Mitka M. 2004, 'Jeremiah Stamler, MD: Researcher, Leader in Cardiovascular Disease Prevention', *Journal of the American Medical Association*, 292, 1941–3.

Murphy S. 1999, 'The Early Days of the MRC Social Medicine Research Unit', *Social History of Medicine*, 12, 389–406.

Niehoff J.-U. 1998, '"Sozialismus ist die beste Prophylaxe"? Anmerkungen zum Präventionsdiskurs in der DDR', in Roeßinger S. and Merk H. (eds), *Hauptsache gesund! Gesundheitsaufklärung zwischen Disziplinierung und Emanzipation*, Marburg: Jonas Verlag, 180–201.

Niehoff J.-U. 1999, 'Anmerkungen zu präventionskonzeptionellen Diskussionen in der DDR', *Jahrbuch für Kritische Medizin*, 31, 103–27.

Niehoff J.-U. and Schrader R.-R. 1991, 'Gesundheitsleitbilder—Absichten und Realitäten in der Deutschen Demokratischen Republik', in Elkeles T., Niehoff J.-U., Rosenbrock R. and Schneider F. (eds), *Prävention und Prophylaxe: Theorie und Praxis eines gesundheitspolitischen Grundmotivs in zwei deutschen Staaten 1949–1990*, Berlin: Edition Sigma, 51–74.

Oakley A. 2010, 'Appreciation: Jerry [Jeremiah Noah] Morris, 1910–2009', *International Journal of Epidemiology*, advance access, published 16 January 2010; doi:10.1093/ije/dyp390.

Oehler-Klein S. and Roelcke V. (eds) 2007, *Vergangenheitspolitik in der universitären Medizin nach 1945: Institutionelle und individuelle Strategien im Umgang mit dem Nationalsozialismus*, Stuttgart: Franz Steiner.

Oppenheimer G. M. 2005, 'Becoming the Framingham Study, 1947–1950', *American Journal of Public Health*, 95, 602–10.

Oppenheimer G. M. and Rosner D. 2002, 'Two Lives, Three Legs, One Journey: A Retrospective Appreciation of Zena Stein and Mervyn Susser', *International Journal of Epidemiology*, 31, 49–53.
Oransky I. 2004, 'Ancel Keys', *Lancet*, 364, 2174.
Rabson S. M. 1936, 'Alfred Grotjahn, Founder of Social Hygiene', *Bulletin of the New York Academy of Medicine*, 12, 43–58.
Rapoport I. 1997, *Meine ersten drei Leben: Erinnerungen*, Berlin: Edition Ost.
Reindl J. 1999, 'Akademiereform und biomedizinische Forschung in Berlin-Buch', in Ritter G. A., Szöllösi-Janze M. and Trischler H. (eds), *Antworten auf die amerikanische Herausforderung: Forschung in der Bundesrepublik und der DDR in den 'langen' siebziger Jahren*, Frankfurt/New York: Campus, 339–60.
Rothstein W. G. 2003, *Public Health and the Risk Factor: A History of an Uneven Medical Revolution*, Rochester: University of Rochester Press.
Schagen U. and Schleiermacher S. 2005 (eds), *100 Jahre Sozialhygiene, Sozialmedizin und Public Health in Deutschland*, CD ROM, Berlin: Institut für Geschichte der Medizin an der Charité.
Schipperges H. 1986, 'Begegnungen mit der Zeitgeschichte', in Schipperges H., Schlemmer J. and Wagner G. (eds), *Ein wahrer Forscher wird nie alt: Hans Schaefer zum 80. Geburtstag*, Heidelberg: Verlag für Medizin Ewald Fischer, 127–38.
Schleiermacher S. 2004, 'Experte und Lobbyist für Bevölkerungspolitik: Hans Harmsen in Weimarer Republik, Nationalsozialismus und Bundesrepublik', in Fisch S. and Rudloff W. (eds), *Experten und Politik: Wissenschaftliche Politikberatung in geschichtlicher Perspektive*, Berlin: Duncker & Humblot.
Schorr R. 1987, 'Nachruf', *Charité-Annalen*, 7, 64–5.
Smith G. D. and Susser E. 2002, 'Zena Stein, Mervyn Susser and Epidemiology: Observation, Causation and Action', *International Journal of Epidemiology*, 31, 34–7.
Süß W. 1998, 'Gesundheitspolitik', in Hockerts H. G. (ed.), *Drei Wege deutscher Sozialstaatlichkeit: NS-Diktatur, Bundesrepublik und DDR im Vergleich*, München: Oldenbourg, 55–100.
Susser M. 1985, 'Epidemiology in the United States after World War II: The Evolution of Technique', *Epidemiologic Reviews*, 7, 147–77.
Tennstedt F. 1976, 'Sozialgeschichte der Sozialversicherung', in Blohmke M., v. Ferber C., Kisker K. P. and Schaefer H. (eds), *Handbuch der Sozialmedizin. Band III: Sozialmedizin in der Praxis*, Stuttgart: Ferdinand Enke, 385–492.
Tennstedt F. 1977, *Soziale Selbstverwaltung: Geschichte der Selbstverwaltung in der Krankenversicherung*, Bonn: Verlag der Ortskrankenkassen.
Timmermann C. 1999, *Weimar Medical Culture: Doctors, Healers and the Crisis of Medicine in Interwar Germany, 1918–1933*, PhD Dissertation, Manchester: University of Manchester.
Timmermann C. 2001, 'Rationalizing "Folk Medicine" in Interwar Germany: Faith, Business, and Science at "Dr. Madaus & Co."', *Social History of Medicine*, 14, 459–82.
Timmermann C. 2005, 'Americans and Pavlovians: The Central Institute for Cardiovascular Research at the East German Academy of Sciences and its precursor institutions as a case study of biomedical research in a country of the Soviet Bloc (c. 1950–80)', in Berridge V. and Loughlin K. (eds), *Medicine, the Market and the Mass Media: Producing Health in the Twentieth Century*, London: Routledge, 244–265.
Timmermann C. 2006, 'Hexamethonium, Hypertension and Pharmaceutical Innovation: The Transformation of an Experimental Drug in Post-war Britain', in Timmermann C. and Anderson J. (eds), *Devices and Designs: Medical technologies in historical perspective*, Basingstoke: Palgrave, 156–174.
Tunstall-Pedoe H. 2003, *The WHO MONICA Project. MONICA Monograph and Multimedia Sourcebook*, Geneva: World Health Organization.
Weindling P. 1987, 'Medical Practice in Imperial Berlin: The Casebook of Alfred Grotjahn', *Bulletin of the History of Medicine*, 61, 397–410.
Wilkinson R. G. and Marmot M. 2006, *Social Determinants of Health*, 2nd edn, Oxford: Oxford University Press.
Wolle S. 1999, *Die Heile Welt der Diktatur: Alltag und Herrschaft in der DDR 1971–1989*, München: Econ & List.