

Risk Assessors and Bio-Participants: *Homo Europaeus* in Contemporary Nutrition and Health Research

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RESÜMEE

Dieser Beitrag untersucht die Konstitution des *Homo Europaeus* durch die Wissensgenerierung im Feld Ernährung und Gesundheit. Hierzu fokussieren wir die konkreten Arbeitsweisen, Kategorisierungen und Standardisierungen in der biomedizinischen und gesundheitswissenschaftlichen Forschung sowie deren Differenzproduktion. Wir folgen den wissenschaftlichen Verfahren, durch die das „Europäische“ als performative Kategorie in Gesundheitswissenschaft und Präventionspolitik hervorgebracht, kritisiert, hinterfragt und erneuert wird. Die demografisch-epidemiologische Erhebung des Europäischen wird dabei weniger als Realität abbildend sondern als Realität hervorbringend untersucht – insbesondere im Hinblick auf ihr Neu-Konfigurieren des Verständnisses von Bürgerschaft. Hierfür spielen technokratische Praktiken der Risikoabschätzung sowie neue Formen der Arbeit und Partizipation an der Wissensbildung eine zentrale Rolle. In den Verfahren der Wissensproduktion selbst konstituiert sich der *Homo Europaeus* nicht zuletzt als Datenproduzent und -konsument.

European intervention trials, European nutrient databases and European nutrigenomics networks – such are the biomedical infrastructures that convey a sense of a *European* science of nutrition and health. Beyond the EUropeanness of its organizational networks, these biomedical projects also produce segmentations of European populations in terms of biological difference, *e.g.* in statements such as, “half of the Europeans express no GSTM1 enzyme” or “nearly half of the Europeans are slow acetylators.”¹ These com-

1 Annual Report of the German Institute of Human Nutrition, 1997/1998, pp. 52-53.

munications perform the “European” as at least one among many reference categories in biomedical research. However, late 20th century biomedical research does not envision this “European” as made up by typological characteristics, but rather along sets and segments of statistical frequencies. Often, a host of differences within, rather than any unifying characteristics, are exposed. Beyond addressing the “European” explicitly, much of the actual production of the “European” is rather implicit. Key mechanisms here include the effects of EU-wide standardizations of knowledge production, and the stabilization of a universalized rationality as well as a certain *habitus* of the European citizen and consumer.

This article examines the production, imagination and reification of a contemporary *Homo Europaeus* at several levels: While there is a somehow presupposed and at times bio-statistically described “European” on the one hand, there is a continued re-emergence of the “European” produced at a bureaucratic level of the European Union harmonization processes on the other hand. We will describe some features of how this “European” is configured as risk manager and bio-participant in the field of nutrition and health, in particular, in a research setting of nutritional epidemiology.

Much of biomedical research has been driven by “applied” research fields, such as “nutrition and health”. Technologies of sequencing and bio-banking have prompted a host of sub-disciplines and approaches. These emerging research fields frame nutrition and health in terms of risk factors and markers that have emerged from genomic technologies, such as nutritional genomics, transcriptomics, proteomics, metabolomics, and bio-informatics,² to name a few of these highly specialized, technology-bound research areas. Beyond the techniques of molecular biology, formalizations of nutrition studies take place in population studies of “modern epidemiology”³. We refer to the approach of risk factor epidemiology as extended laboratory of epidemiological studies that include surveys, observational studies and prevention trials conducted in defined samples of the population.

Today, millions of people in Europe participate in epidemiological studies. Epidemiological studies often include large samples of the population in defined geographic areas and collect individual data on lifestyle and dietary habits. Moreover, they ask participants to undergo basic physical examinations and consent to make their medical records accessible to the study. While at the collective level, epidemiological reasoning is part of a culture of statistical risk assessment, these practices do not go without reconfiguring the ways in which the body, health and disease are understood and concepts of being a citizen-participant and a (potential) patient conceptualized and lived. In order to understand these regimes of knowledge generation, we examine the emergent *Homo Europaeus* as a result of the actual research set-up and practices.

2 These terms stand for emerging fields of biomedical research in the postgenomic age, i.e., the era after completion of the human genome project. Here, the focus is not only on genes but also on, e.g., proteins (proteomics) and on functional understanding and the complexity of epigenetic mechanisms.

3 “Modern epidemiology” is defined as “the study of distributions and determinants of health and disease in populations and subpopulations,” see J.M. Last, *Dictionary of Epidemiology*. New York 2001.

This article broadens the perspective to include the more implicit processes of how the contemporary *Homo Europaeus* is constituted, as individuals and groups become subject to and engage with practices and processes labeled “EUropean.” We explore how research into nutrition and health produces the “European” both in generating scientific knowledge about a European population and in developing and performing a “European approach” within “global” biomedicine. Recent research into the history of ‘the European’ has mostly focused on social constructions of the *Homo Europaeus* in institutions and specific policy settings.⁴ Social scientists and anthropologists have examined how “eating and drinking are acts of identification, differentiation and integration, particularly in the social areas of ethnicity and national identity.”⁵ These studies describe eating and drinking cultures as key to the negotiation of belonging to a certain group or imagined community. In our case, we ask how eating and drinking of the “European” is transformed into an object of quantitative knowledge production. In other words, we explore how contemporary biomedical sciences make sense of nutrition and health and how, in this process, they reconfigure and perform the “European.” By looking closely at the methods of recruitment, data collecting and risk assessments, this approach can highlight not only the reconfiguration of notions of food and health, but also focus the re-territorializations that take place in relation to the contemporary *Homo Europaeus*. The modes of knowledge production and consumption discussed in this article are by no means only European, but they are *made European* in the ways they are performed and enacted within a European infrastructure.

This article is divided into four sections: we will first look into the making of data infrastructures by researchers and participants of a multicentre European study; second, we follow the research practices from recruitment to statistical modeling. We then discuss how, in global research consortia of contemporary nutritional epidemiology, Europeans are construed in opposition to non-Europeans; we trace the categories of interests to epidemiology, along which subpopulations are constructed. Finally, we look into health policy contexts for the ways in which the study results circulate back to “European” societies, *e.g.*, in nutrition and health monitoring and in “targeted” public health interventions.

1. Doing the epidemiological assemblage: researchers and participants

For the exploration of epidemiological studies, we found inspiration in the concept of “assemblage”⁶ to think about the heterogeneity of epidemiological practices. In the heterogeneous assemblage of nutritional epidemiology otherwise disparate contexts and vari-

4 L. Bluche, V. Lipphardt, K. Patel, *Der Europäer – ein Konstrukt. Wissensbestände, Diskurse, Praktiken*, Göttingen 2009.

5 T.M. Wilson, Food, drink and identity in Europe: Consumption and the construction of local, national and cosmopolitan culture, in: *European Studies*, 22, 2006, pp. 11-29, here p. 26.

6 G. Deleuze, G., F. Guattari, *A thousand plateaus*, London, 1988; P. Rabinow, *Anthropos Today. Reflections on modern equipment*. Princeton 2003.

ables meet, when exposure data on nutrition, genetics, and lifestyle are examined for statistical associations with disease frequencies. While data variables from different contexts can become statistical “risk factors”, the conceptual matrix of disease causation is under incessant negotiation. In their inherent knowledge economy, successful epidemiological studies need to be open enough to integrate new variables and generate novel etiological hypotheses. In that sense, they function as productive research systems,⁷ as constellations within which new research questions can emerge. Epidemiological research systems include the study designs, questionnaires, protocols, collaborators, institutions, repositories of data and samples, offices, hardware and software. Our case – the EPIC study, a European multicenter study in nutritional epidemiology – was implemented in the early 1990s with combined funding that included a major contribution from the European Union’s, then new, public health research agenda of 1992, as part of the program “Europe Against Cancer.” The overall number of participants from 12 European countries amounts to more than half a million. In what follows, we refer mostly to two centers in Germany and in Denmark, where our empirical research took place. In this first section, we approach the epidemiological assemblage through its human actors – researchers and participants.

A principle investigator describes the European dimension of the study first and foremost as a “fantastic long-term collaboration of very different people, opinions and perspectives over 20 years,” and as a highly productive project in terms of publications, produced by many working groups using the data resources for their specific topics. Thus it is the research infrastructure on the one hand that is European, due to its financial support for infrastructure building, which provided research groups in Europe with the means to set up and implement a population study using standardized techniques. On the other hand, in the very process of this research, “Europeans” become a specific population targeted by biomedical research. Hence, “EUrope” is more than a funding institution, the European population is both the “object” of research, as well as the “funder” and, later, the targeted “consumer” of results. Professional practitioners of risk assessment represent one contemporary version of the *Homo Europaeus* as risk assessors aiming at optimizing European population health.

Managed encounters: recruitment and participation

The first contact between researchers and participants takes place during recruitment.⁸ Participants are contacted with a letter of invitation that introduces the aims of the study and proposes an appointment. In both the former East German study center and in Denmark, the study was presented in public as mainly a local project. In the German case, this was a deliberate consideration in the early 1990s, addressing the recent change in the economic system after the reunification. As a researcher from the German study

7 We use the term “research system” in analogy to the notion of “experimental systems” introduced in H.-J. Rheinberger, *Towards a theory of epistemic things. Synthesizing proteins in the test tube*. Stanford 1997.

8 In most centers, the “sampling procedure” for the study drew on national civil registration systems.

ponders, confronting participants with the idea that “now it is about Europe” just four years after the reunification would hardly have worked. In the Danish case, this was different and the emphasis was on the local level⁹ and the study was given the Danish title “Kost, kræft og helbred (Diet, Cancer and Health)”. Like the other Scandinavian EPIC projects, it was first and foremost conducted as a local study, but also embedded in the European network from the beginning. The fact that this was a multicenter study at the European level did not play a major role in communications for recruitment, but was an important feature for the researchers from the beginning. To epidemiologists, it was clear that only very large numbers would allow investigations into small differences in dietary habits and their role in disease causation, particularly in rare cancers and the then emergent field of gene-lifestyle interactions. Framing this process in the terms of actor-network-theory, the *interressement*¹⁰ that draws researchers to the study is in the database as empirical resource for biomedical research. The negotiations of *interressement* for participants are less straightforward and those agreeing to participate often expect benefits and, even though at no point promised by the study, some diagnostic results that would be relevant to their own health.

Within Europe, the working infrastructures in which the epidemiological studies are embedded differ depending on context and on country and region – this was also the case for the EPIC study. As to the situation in Germany, recruitment for epidemiological studies is generally viewed as difficult and epidemiologists are often struggling with low response rates.¹¹ The implications of low and differential response are a major concern as to the validity of any epidemiological study, leading to different strategies of framing the study in public communications. In both cases, the fact that the study was part of a European multicenter study was not emphasized. In the East German case, the Institute for Nutrition Research that conducted the study had already been renowned in East Germany before 1989. Officially recognized in the “Blue List” of those research institutes selected to obtain continued state funding while much of the East German research infrastructure was closed down, the institute stood to some extent for continuity, which was valued by residents in the region and local nutrition scientists. Thus for participants from the region, the research institute, with the inception of a new study in 1993, gave a sense of stability beyond the radical political and economic restructuring that led to disappearance of nearly the entire former societal institutions of the GDR.

In Denmark the inception of the study started as an entirely local project under the title “Kost, Kræft og Helbred” (Diet, Cancer, and Health) with Danish funding. That there

9 When the network was started, Danish epidemiologists knew that they could secure local funds for such a study.

10 For the terms “interressement” and “enrolment” as part of translation processes, see: M. Callon, Some Elements of a Sociology of Translation: Domestication of the Scallops and the Fishermen of Saint Brieuc Bay, in: J. Law (ed.) *Power, Action and Belief: a new Sociology of Knowledge?* Sociological Review Monograph. London 1986, pp. 196-233.

11 U. Latza, A. Stang, M. Bergmann, A. Kroke, S. Sauer, R. Holle, P. Kamtsiuris, C. Terschüren, W. Hoffmann, Zum Problem der Response in epidemiologischen Studien in Deutschland, in: *Gesundheitswesen* 66 (2004), pp. 326-336.

was an add-on through the European study only played a minor role in the implementation of the study. Studies on research participation in Denmark also showed that most citizens view their participation in medical research as “giving something back” to the state health care system from which they benefit.¹² There is also a major difference in conditions for epidemiological projects between Germany and Denmark: Whereas in many countries data on diagnoses need to be collected and obtained via questionnaires and individual consent needs to be obtained, epidemiologists in the Nordic countries can draw on central registries via record linkage, for instance to obtain information on cancer diagnoses. This feature of a central registry infrastructure made the conditions for the Scandinavian EPIC studies particularly favourable.¹³

Together the different local recruitment efforts conducted for the multicenter study have resulted in a European population study on nutrition and health. Once all variables were quantified and transformed into databases, an epidemiological research platform¹⁴ became available for statistical scrutiny and modeling of population health.

Transforming eating and drinking into numerical datasets

In order to create an empirical knowledge base, nutrition scientists need to establish and maintain logistics to enroll thousands of participants in examinations and in questionnaire surveys. Nutrition questionnaires play a key role as an instrument to transform the everyday eating habits of individual participants into quantitative variables. By means of this transformation, nutrition data is integrated into the framework of risk factor epidemiology.¹⁵ Filling in these questionnaires can take several hours and requires an active translation of one’s eating and drinking practices into the categories on the questionnaire. The study design also comprised standardized medical and anthropometric examinations and detailed questionnaires on nutrition, lifestyle and health. Several interviewed participants stated that they enjoy completing the questionnaires and that the latter do not pose particular problems. Others found that the questions relating to frequency of eating particular food items or consumption of beverages were not that straightforward, as they required a particular mode of knowledge production and transfer. For instance, the questionnaires demand average consumptions and gave little space for the irregularities of everyday life that make up the social realities of eating and drinking habits. One of the informants pointed out that she can eat a whole bar of chocolate during one evening, but then will not touch any for a whole month. Thus, completing the questionnaire required

12 U. Lind, T. Mose, L.E. Knudsen, Participation in environmental health research by placenta donation – a perception study, in: *Environmental Health* 6 (2007), p. 36.

13 J.H. Olsen, L. Mellekjær, S. Friis, 2004, Fra kræfttælling til cancerregister, in: *Ugeskrift for Læger*, 166 (2004), 15-16, pp. 1458-1459.

14 For the notion of “biomedical platform,” see: P. Keating, A. Cambrosio, *Biomedical platforms. Realigning the normal and the pathological in late-twentieth-century medicine*, Cambridge, MA 2003.

15 On risk factor epidemiology in the US, see R. Aronowitz, *Making sense of illness. Science, society, and disease*, Cambridge 1998. For the “multifactorial model” as a black box, see J. Shim, *Understanding the routinized inclusion of race, socioeconomic status, and sex in epidemiology: The utility of concepts from technoscience studies*, in: *Sociology of Health and Illness* 24 (2002) 2, pp.129-150.

to estimate averages over longer periods of time and doing abstractions from the irregular realities of everyday life in which many different social circumstances and constellations of work and leisure activities can be spontaneous rather than habitual. Much of nutrition seems to resist quantification and notions of regularity. Participants sometimes felt that they had to adapt their accounts to the items on the questionnaires “in order to bring their practices of everyday life into the format of a statistical average.” The participants we interviewed were well aware of this “translation” of much more complex realities of their everyday lives while striving to deliver the required data on average intakes. A participant in the Danish pilot study pointed out that she and her husband enthusiastically complete every questionnaire from health authorities as well as from marketing surveys and that it was interesting to see how many details of everyday life are of relevance to these scientific studies. Together with the desire to do something useful for science, there were also moments of exploration of these categories as to one’s everyday life, which was about playing with and probing the categories of the questionnaire. Knowledge exchange was conceived of as giving something back to medical science, but also to tentatively adopt an outside, “scientific” perspective on one’s own life.

Filling in a standardized questionnaire required participants to engage with the categories and standards of the study. Participants who repeatedly were asked to complete follow-up questionnaires experienced this, once enrolled in the study, as an obligation. There is both reassurance and a sense of imposed duty that was reported with having made the “choice” of participation. When they were late filling in the questionnaires they had obtained via mail participants described having “a bad conscience”; they felt obliged to comply with the study protocol as participant. The multiple written reminders and subsequently phone calls they obtain from the institute also reinforce these obligations. These can function in the mode of interpellation, described by Althusser to enroll subjects into the authority exercised by an apparatus that calls them to act in particular ways.¹⁶

Bioparticipation: Samples for future research

Like many epidemiological studies in the age of genomics, the EPIC study also included storage of DNA in a biobank. Most of the centers collected and stored blood samples, while some centers, among them the Danish study, additionally collected more biological materials, including urine, adipose tissue and toenail clippings from each participant. While, like in genomics, there is much hype in the emerging field of “molecular epidemiology”, biobanking practices have raised controversy, in particular as to the informed consent process with regard to the future, largely yet unknown usages of these repositor-

16 J. Althusser, *Ideology and Ideological State Apparatus (Notes Towards an Investigation)*, in: J. Althusser, *Lenin and Philosophy and Other Essays*, New York 1971. For the notion of interpellation in recruitment by complementary techniques of distance and techniques of presence, see L. Koch, M. N. Svendsen, *Between Neutrality and Engagement: A Case Study of Recruitment to Pharmacogenomics Research*, in: *BioSocieties* 3 (2008), pp. 399-418.

ies.¹⁷ Interestingly, research with blood samples is not considered to require informed consent in the US, while the European bioethics position foresees an explicit informed consent procedure or, at least opt-out possibilities, for secondary studies that reuse materials. Thus, human biological samples do not have the same status – what they are and how they are to be dealt with may differ, not only between scientists and the public, but also between European and North American regulatory frameworks.¹⁸

When samples are stored as material resources even beyond the lives of individual participants, there is a specific configuration of temporal regimes – there seems to be a suspension of time with the freezing of samples. Participants' samples are stored to remain there for the future – in that sense, relations of participants with the study are preserved via frozen samples. There is a continued “frozen participation” – with this – a term with which we also allude to the highly regulated ways epidemiological research takes place and in which participants as research subjects have but little agency. The samples of a biobank are linked to the epidemiological database, which contains data on dietary habits and health of the people who donated the samples to research. With as of yet unclear future usage of these samples, new biomarkers are expected to become relevant; here, this inherent notion of scientific progress creates the infrastructures, co-shaping what will be possible in future research.

The remaking of citizens with biotechnologies in the age of biomedicine has been addressed with the concepts of biosociality¹⁹ and in particular bio-citizenship.²⁰ Some studies have conceptualized biocitizenship as a mode of enacting citizenship by participating in a study or survey; others criticize the concept for reducing more important debates on citizenship into notions of choice or duty and argue for a closer look at the complex social relations in which these are entrenched.²¹ We propose the term “bio-participation” to account for the ambivalence of becoming a research subject. With the notion of bio-participation, we are not arguing for improved regimes of accountability to participants; we propose to use the term as an analytical device to explore and understand how “participation” in epidemiological studies is enacted. Significantly, in the categorization as “active participants” in the follow-up routines of epidemiological studies, being “active” seems to go together with being passive in terms of subjecting oneself to the highly regulated procedures and protocols that participants cannot influence. However, modes of

17 See K. Hoeyer, “Science is Really Needed – That’s All I Know.” Informed Consent and the Non-Verbal Practice of Collecting Blood for Genetic Research, in: *New Genetics and Society* 22(2003) 3, pp. 229-244; H. Gottweis, A.R. Petersen, *Biobanks. Governance in Comparative Perspective*, London 2008.

18 For meanings invested in human biological materials, see e.g., C. Palmer, *The Human and object, subject and thing: the troublesome nature of human biological material*, in: S. Bauer, A. Wahlberg, *Contested Categories. Life Sciences in Society*, Farnham 2009, pp. 15-30.

19 P. Rabinow, *Artificiality and Enlightenment: from Sociobiology to Biosociality*, in: *Essays on the Anthropology of Reason*, Princeton 1996, pp. 91-112.

20 N. Rose, C. Novas, *Biological Citizenship*, in: A. Ong, S.J. Collier (eds), *Global Assemblages: Technology, Politics, and Ethics as Anthropological Problems*. London, 2005, 439-463.

21 For a critical account of bio-citizenship, see A. Plows and P. Boddington, *Trouble with biocitizenship?*, in: *Genomics, Society and Policy* 2(2006) 3, pp. 115-135.

participation are heterogeneous and there are multiple ways of dealing with, handling, or resisting the “choices” or “duties” to serve biomedical research.²² The visits and interaction with staff of the institute as well as their letters and reminders enact a duty to participate. This duty blends into understandings of modes of citizenship, co-constructed by participation as representation in surveys. In the mode of bio-participation, participants are, rather than acting as citizen-participants, *subjected to* a regime of biocitizenship. In that context, filling in a questionnaire, donating a blood sample for research, receiving recommendations and adopting an attitude of prevention are part of a regime of technologies of the self and a mode of contemporary citizenship co-shaped by European bureaucratic processes.²³

2. Data work: calibrating, follow-up, modeling

Drawing attention to the mundane techniques that play a key role in what biotechnologies do, Hannah Landecker has proposed to take as point of departure the technological practices which are routinely described in the “materials and methods” sections of research publications.²⁴ We adopt the approach for the cultural study of biosciences by examining the materials and methods of data work in epidemiology. Here, the knowledge production setting entails a sequence of steps, comprised of study design, recruitment, data gathering, validation and risk modeling. In what follows, we discuss those for the calibrations, follow-up of participants for data and the development of data platforms for hypotheses testing. Infrastructure building and the recombination of data are prerequisites of epidemiological studies. The routine infrastructures of data storing and classifying play a key role in health research and clinical practice.²⁵

European calibrations: the quantification of nutrition

The scientific approach to nutrition comprises the quantification of food intake as a first and crucial step; once quantified, they can serve as a cumulative exposure estimate for epidemiological studies. Epidemiologists operationalize nutrition in various formats, for instance as consumed nutrients or energy intake calculated for each food item and frequencies. By calculating these units based on energy intake or food items, eating habits

22 For an empirical account of modes of participation, see: E. Haimes, M. Whong-Barr, Levels and styles of participation in a genetic database. A case study of the North Cumbria Community Genetics Project, in: R. Tutton, R. Corrigan (eds), *Genetic databases. Socio-ethical issues in the collection and use of DNA*, London 2004, pp. 57-77.

23 M. Foucault, *Political Technologies of the Individuals and the Self*, in: L.H. Martin, H. Gutman, P.H. Hutton (eds), *Technologies of the Self. A seminar with Michel Foucault*, Amherst 1988, pp. 19-49.

24 For instance, cryotechnology has shaped much of later cloning and stem cell research, see: H. Landecker, *Living Differently in Time: Plasticity, Temporality and Cellular Biotechnologies*, in: J. Edwards, P. Harvey, P. Wade (eds), *Technologized Images, Technologized Bodies: Anthropological Approaches to a New Politics of Vision*, New York 2010, pp. 211-234. See also H. Landecker: *Culturing Life: How Cells Became Technologies*, Cambridge 2007.

25 G. Bowker, S.L. Star, *Sorting Things Out. Classification and its consequences*, Cambridge 1999.

become a set of quantitative exposure variables. These can be calculated and rendered comparable in standardized modes based on the data obtained by participants' responses in the questionnaires. Thus, as a first step, nutritional epidemiology generates quantitative data on consumed food products for each individual, using standardized measures. Epidemiologists calculate nutrients and energy intake based on questionnaire data on the various food groups – from meat to salad dressings, and from bread to fruits, with detailed amounts of single items such as apples or citrus fruits.

The challenges of such a study are mostly in the harmonization of data and methods to “measure” nutrition, in particular for the pooled European dataset. In the EPIC study, the questionnaires contain standardized core modules, but also allow for local variation between countries in order to cover regionally specific diets. Ensuring compatibility between different questionnaires required much standardization. This includes conducting so-called *calibration studies* for a subsample of participants from all centers. In calibration studies two methods of measurement are compared, by introducing a third questionnaire for comparison as a reference. For a calibration study within the EPIC network, 40,000 participants of the study were randomly selected from all local cohorts.²⁶ They were then asked to fill in an additional questionnaire, now exactly the same one for all different centers. The purpose of this additional exercise was to calibrate the instruments with which data have been recorded. For example, the questionnaires on fruit and vegetable consumption in countries such as Norway and Greece are not directly compatible, since questionnaires are developed locally and take into account the specificities of local eating cultures. In this situation, calibration via the standard made compatible different instruments without introducing systematic errors.

Following participants for data: follow-up and record linkage

The respective conditions for epidemiological research differ between participating European centers, *e.g.*, between Scandinavian countries with central population registries and countries without cancer registries. For instance in Germany, there is no central cancer registry and therefore direct record linkage to obtain information on cancer diagnoses among participants is not possible. To obtain health-related data, a complex data collection protocol needs to be developed that is based on self-reported data from questionnaires and informed consent for contacting GPs and hospitals in order for confirmation. In our interviews with epidemiologists in Denmark, researchers stressed the fact that they do not need to do follow-up studies, for there are central population registries they can link up with (via unique person-numbers). Registries include the “cancer registry, the hospital discharge registry, the cause of death registry, CPR for addresses and relocations, Statistics Denmark for socio-economic data a database for school health records through the Institute for Preventive Medicine, from which we get birth weight and weight during

26 The recruited sample was weighted by expected cancer rates, which was estimated based on total rates by age and gender.

years at school, ... and the prescriptions registry.”²⁷ Registry research has a long tradition in Denmark and represents a major part of epidemiological activities.²⁸ Similar to other Nordic countries, the use of this health care system data for public health research is largely unquestioned. These “ideal conditions for research in which the whole country can be conceived as a cohort”²⁹ for epidemiological research are often considered a competitive resource in international comparison.

From descriptive analyses to platforms for hypotheses testing

In comparison to other factors, the overall influence of nutrition on chronic disease is considered to be weak. Therefore a certain variation in nutrition, as it is the case within a multicenter European study are considered advantageous and, for instance, there is considerable variation as to fruit and vegetable consumption between Northern Europe and Greece. Descriptive data on these differences, *e.g.*, the range of vegetable consumption, was published as reference material for the study. In these descriptive presentations, columns of numerical data on average intakes of food groups such as fruits, vegetables or meat products in grams per day, adjusted by age, season and day of the week are presented. Displayed in a standardized way, the intake of certain foods becomes comparable between countries and study regions.³⁰ A quantitative inventory of nutrition is produced for the population under study, which generates composite measures that can be compared across the different study centers in Europe. The choice of regions listed in the table is that of the participating study centers and their recruitment strategies. The study populations were mostly from regions adjacent to the involved research centers; this also reflects institutional and personal networks between scientists.

While such descriptive analyses are often presented as part of the materials and methods sections, the actual aim of cohort studies, however, is to investigate the associations between exposures/risk factors and disease. In order to test etiological hypotheses, the influences of dietary habits, markers of genetic variation such as polymorphisms, and haplotypes in relation to disease outcomes are modeled, thereby calculating *e.g.*, the risk of disease, based on the data collected during follow-ups. The modeling is statistically complex. The final configuration of model parameters is based on careful assessment of correlations between variables and statistical significance tests. Technically, risk estimates can be derived from these models in terms of subgroup-specific risk or overall risk estimates for the entire study population (then usually under adjustment for age, gender, etc.). While in the description of the population under study, the country, region or

27 Interview 1, researcher.

28 See: J. H. Olsen, L. Mellemkjær, S. Friis, Fra kræfttælling til cancerregister, in: *Ugeskrift Læger*, 166 (2004) 15/16, pp. 1458–1459 and P.B. Mortensen, Registerforskning i Danmark, in: *Norsk Epidemiologi* 14 (2004) 1, pp. 121-124.

29 L. Frank, *Epidemiology*. When an entire country is a cohort, in: *Science*, 287 (2002) 5462, pp. 2398-9.

30 A. Agudo, N. Slimani, M.C. Ocké, et al., Consumption of fruits, vegetables and other plant food in the European Prospective Investigation into Cancer and Nutrition (EPIC) cohorts from 10 European countries, *Public Health Nutrition* 68 (2002) 5, pp. 1179-1196, here p. 1188.

study center are listed in tables, the variables “region / center” or “country” are invisible in the actual reporting of results.³¹ The hypotheses are about nutrition, lifestyle, genetics and health outcomes, while center or region is only a technical or instrumental variable in the logistics of the study in order to secure “sufficient difference in exposure.”

Agudo et al. (2006) have then stratified for genetic polymorphism and smoking in order to investigate possible interactions; this is one of the gene-lifestyle interactions studies in further analyses. The empirical database of the study population is the resource to scrutinize novel hypotheses; in that way, the central database of a multicenter study functions as a testing platform for parameters that influence population health. Large multicenter studies are – despite the complex standardization processes such as calibration of instruments – of importance to epidemiologists in order to study the influence of ‘weak’ risk factors such as particular food groups or to study rare cancers. In this context, the European network provides research opportunities in terms of jointly observing and comparing a large overall study population with different dietary habits.

3. “European diversity” as a resource for knowledge production

The Endeavours to study complex associations between genetics, lifestyle and nutrition and disease aim for even larger data structures. Only very large studies can achieve the sample sizes required to perform statistically meaningful hypotheses testing to address the challenge of multifactorial models with a host of weak but interacting factors. This is due to new variables emerging from genomics, the plethora of biomarkers in the field of molecular epidemiology and renewed attention to complex interactions. So far, this article has followed the local epidemiological studies up towards the European level. In this part, we explore how this European database, as constituted in the study, is then integrated into more global, universalizing knowledge production about disease causation. As in genomics and biobanking, epidemiologists have established international data infrastructures in the quest for ever-larger samples that pool data from millions of participants to study complex “gene-environment interactions” in genomic epidemiology.³² The pooling of datasets in so-called “global consortia” is a rather novel phenomenon, which became possible with data sharing technologies. Information technologies have been instrumental in making epidemiology – previously, from rather local research at the community level – a “big science”³³ conducted in large multinational consortia.

31 A. Agudo, N. Sala, G. Pera et al., Polymorphisms in Metabolic Genes Related to Tobacco Smoke and the Risk of Gastric Cancer in the European Prospective Investigation into Cancer and Nutrition, in: *Cancer Epidemiology, Biomarkers, Prevention* 15 (2006) 12, pp. 2427-2434, here p. 2431.

32 See e.g., Emerging Risk Factors Collaboration (writing committee J. Danesh, S. Erqou, M. Walker, S.G. Thompson), Analysis of individual data on lipid, inflammatory and other markers in over 1.1 million participants in 104 prospective studies of cardiovascular disease, in: *European Journal of Epidemiology* 22 (2007) 12, pp. 839–869.

33 See e.g., R. N. Hoover, The evolution of epidemiologic science. From cottage industry to “big” science, in: *Epidemiology* 18 (2007) 1, pp. 13-17.

The reification of the “European” as a biomedical category

With genomic epidemiology developing into “big science,” researchers increasingly need to attach their study to larger consortia in order to keep up with methodological requirements. The hypotheses formalized in these global consortia range from the influence of genetic polymorphisms or haplotypes, combined with lifestyle variables on cancer,³⁴ to consortia that examine BMI (body mass index) and mortality in population samples large enough to study, like in toxicology, dose-response relationships, for instance between a lifestyle variable and cancer incidence.³⁵ These projects pool dozens of very large cohorts, mostly from North American, European and Asian studies. In these pooled datasets the notion of the “European” re-emerges, persists and circulates. In some pooling projects the “Europeans” are referred to, jointly with “white Americans”, as “Caucasians”.³⁶ The latter categories are used until the present in censuses and much of the biomedical research conducted in North America since the mid-1990s. They became routine with the implementation of guidelines at the level of the US National Institutes of Health, which demand specification and inclusion of “minority” populations in biomedical research.³⁷ Since European researchers produce publications and data for an international knowledge economy, they frame their own data in the terms and formats that are compatible with international standards and categories. For studies conducted in Europe, authors add to their methods descriptions attributes such as “among mostly Caucasian Germans” or “in more than 95% of Caucasians.” This is to facilitate inclusion in global meta-analyses³⁸ and in order to make the studies compatible with the predominant biomedical categories of globalized biomedicine, which often use the US census classification as a standard. How these categories of “European, White, and Caucasian” are operationalized, however, can remain rather open: While in biomedicine these population categories sometimes run synonymously with ethnicity, in epidemiology they are often used as a flexible surrogate variable,³⁹ which stand for something else: for further differentiation that can be conceptualized as biological or social. Often, the self-identified US-census category “race” is routinely included⁴⁰ and then, sometimes tacitly, interpreted in terms of difference either in exposure, social status or genetics.

34 See studies by the Breast and Prostate Cancer Cohort Consortium (BPC3): www.epi.grants.cancer.gov/BPC3/ (accessed 30 June 2009)

35 For mortality studies, the categorization derives from the main groups of the International Classification of Diseases (ICD) and includes “all causes of death,” “all cancers,” “all cardiovascular conditions.”

36 The category “Caucasian” was introduced by Blumenbach in the early nineteenth century for people from Europe, Northern Africa, the Middle East and parts of central and southern Asia.

37 For the effects of inclusion in biomedicine, see S. Epstein, *Inclusion. The politics of difference in medical research*, Chicago 2007.

38 Meta-analyses combine the results of several studies addressing the same research question; a meta-analysis is conducted to estimate overall effect sizes as a combined quantitative result.

39 Surrogate variables use already existing variables as “proxies” to approximately represent the variable of interest.

40 See J. Shim, *Understanding the routinized inclusion of race, socioeconomic status, and sex in epidemiology: The utility of concepts from technoscience studies*, in: *Sociology of Health and Illness* 24 (2002) 2, pp. 129-150.

Hence, the European as a population category, only emerges in the comparison to a non-European “other”: Asian, African populations, or Caucasian North Americans. The construction of the category of European as different from a non-European “other,” be it the oriental, the Asian, the African, has a colonial history in which western biomedicine is deeply entrenched.⁴¹ Europe is constructed as homogeneous in certain ways, at least when viewed from outside or in comparison with the non-European “other.” While region and regional diversity are of significance within Europe, the “European” remains heterogeneous unless the data is pooled with American cohorts: Then, the European becomes homogeneous, sometimes reifying categories of Euro-American „race science“, such as racialized labels “Caucasian”.

Difference as a resource: creating a European research platform

While epidemiology has increasingly developed into big science, with large-scale multi-center studies prioritized for reasons of statistical power, some researchers have expressed concerns about limitations of these very large studies. Their concerns include monopolization effects if all studies are pooled into a global mega-study. One of the concerns here is that once all data are synthesized, the findings cannot be challenged by competing studies and, given just one global pool, there would be no independent database left to test these results. While mainstream science aims to establish ever larger data structures that allow multiple statistical tests, others question the sole aim of increasing the sample size and argue for several consortia. Referring to the principle of falsification, it is argued that there should be opportunities to “compare these findings in a second study and could ... benefit from a test-retest situation”⁴²

Quantitative comparison and the estimation of difference are the principle tools in epidemiological research. This requires differentials that can be used for calibration and that ensure that variation becomes measurable. Nutritional epidemiologists stress that “Europeans”, as a study population, exhibit regionally specific, quite different dietary habits, which they see as advantage of their study population. Differences in dietary patterns that result from the regional diversity of food products are operationalized for epidemiological association studies to link exposure variables such as nutrition to health and disease at the population level. Research questions posed to the data include whether there are regional influences, for example if being overweight is a regional phenomenon, *i.e.*, whether there is a higher risk in Italy, Greece and Spain or in Northern Europe – and whether there are differences in latency periods. Epidemiologists require some degree of heterogeneity in exposure and “diversities” in nutrition habits within Europe, which is

41 For analyses of inherent eurocentrisms and othering, postcolonial studies have been instrumental, see e.g., H. Bhabha, *The Location of Culture*. London 1994; S. Hall, *When Was “the Post-colonial”?* Thinking at the Limit, in: L. Curti and I. Chambers (eds) *The Post-colonial Question: Common Skies, Divided Horizons*. London 1996, pp. 242-260; G.C. Spivak, *Explanation and Culture: Marginalia*, in: D. Landry, G. MacLean (eds) *The Spivak Reader*, New York 1996, pp. 29-51.

42 Interview 2, researcher.

conceived as a quasi-experimental opportunity to study the influence of nutrition on human health in a much more general sense. These opportunities are used to estimate differences in disease risks between flexible subgroups with different dietary habits. In the context of epidemiological studies, regional characteristics – different from the emphasis on place and the local in notions of *terroir*⁴³ – function rather instrumentally: difference is “taken advantage” of for study purposes – in the textbook tradition of “natural experiments.”⁴⁴ Regional difference in eating cultures is transformed into a “quasi-experiment,” which then can be used as a matrix to generate and test novel hypotheses. The geographic differentiation of the initial stage is transformed into another flexible segmentation of the population according to epidemiological variables.

4. The re-circulation of European nutrition and health estimates into society

In addition to the investigation of the role of nutrition in disease causation, the European Commission has funded applied projects aimed at developing nutrition recommendations. A large-scale project titled EuroDiet (1998–2000)⁴⁵ was set up with the goal of “translating” scientific knowledge, *e.g.*, from studies in nutritional epidemiology, into public health policy. For these translations into policies, risk estimates are used to estimate the reduction of risk by a particular change or intervention. This implies that epidemiological findings are considered robust enough to be transferred to another setting, *e.g.*, made relevant to population health in general. If this is the case, risk estimates – *e.g.*, of a reduction in relative risk of developing a disease when eating a certain amount of fruits and vegetables by some precise factor – leave the epidemiological research and begin circulating as “immutable mobiles”.⁴⁶ In this way, they enter health policies but also clinical medicine.

EuroDiet: from research to policy

The field of public health has played an important role in the European funding frameworks since 1992, when the Maastricht Public Health Framework, including five specific action programs – cancer, Aids, drug dependency, health promotion and health monitoring – was adopted. A good example of the research strategies of the European framework provides the project “EuroDiet” and its aim to develop tools in order to enable “the considerable body of scientific evidence on healthy nutrition and lifestyles...

43 For the term “terroir” see P. Laville, *Le terroir, un concept indispensable à l’élaboration et à la protection des appellations d’origine comme la gestation des vignobles: le cas de la France*, in: *Bull. OIV* 217 (1990), pp. 709-710. In particular, the notion of heterogeneity and diversity “in unity” was of significance with respect to regional food products.

44 See *e.g.*, C.J. Roberts, *Epidemiology for Clinicians*, London 1978.

45 The project was followed by specific single-issue projects and campaigns, *e.g.*, on reduction of alcohol or increase of physical activity, have been developed. These are coordinated by the European Commission’s Agency for Health and Consumers.

46 B. Latour, *Science in Action: How to Follow Scientists and Engineers Through Society*, Milton Keynes 1987.

to inform health policy.”⁴⁷ The goal of “EuroDiet” was the “development of European dietary guidelines, which will provide a framework for the development by member states of national food-based dietary targets”,⁴⁸ and it included leading scientists, policy advisors, national and European agencies, NGOs, food industry, educational, social, cultural consumer organisations.

To achieve the translation from research to policy, four groups to work on “health & nutrients,” “nutrients & food,” “foods & people,” and “people & policies” were set up. The design of these successive work packages moves “from nutrients to people,” thus taking the opposite approach of epidemiological studies: The epidemiologic research process, translates everyday life habits into data on eating and drinking, obtained via questionnaire. These undergo transformation through multivariate modeling, resulting in aggregate risk estimates. In the opposite way, the step-wise translation agenda of “EuroDiet” takes the risk estimates and translates them back to modify and optimize the eating and drinking practices in order to improve population health. The division of the project into work packages is organized along stages of these translations: its point of departure are the risk estimates for nutrients in relation to health; from there the project recontextualized that format of knowledge in terms of actual food and food groups; subsequently, “foods and people” and “people and policies” take these results to policies and to the individual citizen. This conceptualization renders risk estimates as a European knowledge base for successive translation into dietary policy. That this scientific “Europeanness” is performed across administrative and policy levels evokes a homogeneous scientific dietary principle. Based on the health patterns in Europe and associations with dietary patterns measured in nutrients, scientists formulate nutrient targets for “effective food-based dietary recommendations,” which in turn are consulted for “health promoting changes in eating and physical activity patterns”.⁴⁹ The latter then enter a re-design of the broader policy framework. As those are based on evidence from risk factor epidemiology, this successive translation pushes frameworks of prevention from socio-economic factors toward individualized notions of “lifestyle choices”.

Evidence-based medicine and evidence-based policy as European governance model?

“Practical European guidelines for diet-related disease prevention and health promotion”⁵⁰ were developed to translate the scientific evidence into European policy frameworks. Analyzing the tactics to make such translations happen can shed some light on the processes that stabilize both scientific knowledge and European policies.⁵¹ In view of

47 EuroDiet report <http://eurodiet.med.uoc.gr/first.html>, p.1 (accessed 30 June 2009).

48 EuroDiet report <http://eurodiet.med.uoc.gr/first.html>, p.1 (accessed 30 June 2009).

49 EuroDiet report <http://eurodiet.med.uoc.gr/first.html> (accessed 30 June 2009).

50 EuroDiet report <http://eurodiet.med.uoc.gr/first.html> (accessed 30 June 2009).

51 S. L. Star, *Triangulating Clinical and Basic Research: British Localizationists, 1870–1906*, in: *History of Science* 24 (1986), pp. 29–48. Janet Shim has analyzed the role of triangulation as to the management of uncertainty in the process of epidemiologic knowledge generation. See J.K. Shim, *Understanding the routinised inclusion of race,*

multiple uncertainties, these are managed in order to successfully establish a theory or a connection by simultaneously employing several methods that provide a cumulative or “global certainty,” even though knowledge of local fields might be uncertain. A further tactic identified by Leigh Star and described for epidemiology by Janet Shim is the “displacement of epistemological questions with lower-level technical debates.”⁵² With this “scientification” of health policy and economic accountability, much decision-making is based or justified by drawing on epidemiologic findings. This, however, is not a specifically EU-European path, but a general trend of Western governance models. These modes of governance increasingly draw on “scientific evidence” and adopt a model similar to evidence-based medicine,⁵³ but now in the context of policy-making.

Other domains in which epidemiological studies circulate back to society include risk assessments in clinical and preventive medicine. A number of scores for clinical risk assessments are in use, but only a few of them take nutrition into account. Rather, most of them address nutrition-related factors in terms of biomarkers measured in blood, such as cholesterol levels.⁵⁴ The European cardiovascular risk score, “Systematic Coronary Risk Evaluation” (SCORE), recommended by the European Society of Cardiology, is one such tool. Displayed on color, paper charts or in electronic format, the tool provides a system of classification stratified by gender, age, smoker/non-smoker and gives risk figures⁵⁵ for the 10 year risk of fatal CVD in populations at high or low risk. The score is based on cohort and mortality data in Europe and calculates risk estimates for high and low risk countries – it performs a division of Europe into high risk (Northern Europe) and low risk (Mediterranean) countries. This can be viewed as a “biomedicalized reterritorialization” of Europe into high and low-risk countries with respect to cardiovascular risk. This difference in risk is then enacted in clinical practice, which may lead to different clinical decisions for patients with otherwise the same profile, depending on whether he/she lives in high or low risk countries, *i.e.*, Germany or Switzerland, Belgium or France. Physicians working with evidence-based medicine and drawing on these studies actively use these categories when talking to the public and to patients. In these re-individualizations, the categories of the research design are looped back into doctor-patient encounters.

socioeconomic status and sex in epidemiology: the utility of concepts from technoscience studies, in: *Sociology of Health & Illness* 24 (2002) 2, pp. 129-150.

52 *Ibid.*, p. 138.

53 In evidence-based medicine (EBM) evidence hierarchies are based on biostatistical criteria – with systematic reviews of randomised clinical trials at the top, observational cohort studies in observational epidemiology as intermediate level and bench science or expert opinions at the lower end of the hierarchy; for an account of EBM, see: G. Weisz, From clinical counting to evidence-based medicine, in: G. Jorland, A. Opinel, G. Weisz (eds.), *Body counts. Medical quantification in historical & sociological perspectives*, Montreal 2005, pp. 377-393. For a discussion in medical science context, see: D. L. Sackett, W.M.C. Rosenberg, J.A.M. Gray, R.B. Haynes, W.S. Richardson, *Evidence Based Medicine*, *British Medical Journal* 312 (1996), pp. 71–72.

54 In terms of action, these tools foresee the prescription of drugs to lower cholesterol levels – while other lifestyle factors (physical activity) are addressed in terms of recommendations for individualized lifestyle changes rather than focusing on change of nutrition habits.

55 The calculation is based on mortality data.

In the field of nutrition and health, public health recommendations are part of primary prevention policies. However, only a few nutrition-related factors are considered as having enough support by scientific evidence. While, for instance, salt intake, folic acid, and iodine supplementation are included in EU policies and recommendations, only the increase of breastfeeding, fruit & vegetable consumption and physical activity are considered robust enough in terms of the available evidence. Already in the EuroDiet report, it is these three factors that remain in terms of specific goals after the “translation process” and consideration of the “evidence base.” Given the high profile of biomedical nutrition research, these key areas of policy action seem rather modest. Increasing fruit consumption is one such recommendation – at an international level a campaign to increase fruit and vegetable consumption has been conducted – the “5 Per Day” campaign. The German Nutrition Society follows that global recommendation after a WHO study on prevention of chronic disease recommended to eat 400 grams fruits/vegetables a day or more. In Denmark, a similar campaign called “6 Per Day” was started by the Danish Cancer Society and the Danish Ministry of Food, Agriculture and Fisheries. The Danish “6 Per Day” website explains core strategies of the Danish campaign: From “maybe 600 grams or more” to “6 Per Day,”⁵⁶ they see as necessary a science of behavior change, intervention research, communication science, but also lobbying and coalition-building and fundraising skills to reach the goal of increasing the consumption of fruits and vegetables. Following the most efficient strategy, changing behavior instead of changing attitudes first, their strategy is to make it possible to include free food at workplaces. The “5 Per Day” recommendation of fruits and vegetables is also referred to in a 2001 article in the German popular nutrition journal “Ernährungsumschau (Nutrition Survey)”; however, the article states that the “scientific proof” for the effect of such changes in dietary habits is still lacking – that observational cohort studies will help provide such evidence.⁵⁷ Large observational cohort studies are seen as a way to empirically establish proof of the effect of nutritional changes that will count as evidence for policy. The fact that for a lot of diet recommendations, there is no detailed formal proof in accordance with the latest standards, keeps the “need” for further studies to continue. This shows the data work and translation exercises conducted for rather straightforward recommendations (such as “eat more fruits and vegetables”) for their implementation into health promotion policies. Rather than new approaches or breakthroughs, the performative effects of these activities are in the establishment of a novel culture of accounting and accountability in public health that is shaped by evidence-based reasoning in policy.

56 <http://6omdagen.dk> (accessed 30 June 2009).

57 N. Krahl, M. Bergmann, K. Kohlenberg-Müller, H. Boeing, Einflussfaktoren auf Ernährungsänderungen in der EPIC-Potsdam-Studie. *Ernährungsumschau* 12 (2001), 1, p. 479.

Diversity managed: the creation of a common space by harmonizing instruments

Moreover, quantitative epidemiological risk estimates can be integrated in economic modeling and in cost benefit reasoning. For instance, the cost of a public health intervention is measured in terms of reduction of risk in the target population. Conceptualizations such as “the cost of sedentary lifestyles,” calculations of “disability-adjusted life years (DALYs)” and the “burden of disease in a population” bear witness to the influence of economic models used in the governance of population health.

The need for comparable statistics as a prerequisite for policy has reached a status of being demanded by the public and much part of common sense. This justifies the huge effort to develop “harmonized” methods for dietary surveys, health surveys and the monitoring of food. As in other fields where Europeanization takes place, a large part of the effort is in standardizing or “harmonizing” methods and instruments in order to enable comparisons within the EU. The first step towards a unified space of European product standards and health policy is the harmonization of methods.⁵⁸ Translated into statistics with “harmonized methods,” diversity and regional character become visible and manageable, as an apparatus of continual data generation is developing. In that sense, common or compatible measurement techniques, *i.e.*, difference measured with a common standard, produce diversity in unity. In turn, these new modes of accountability justify policies using the means of scientific statistical evidence and cost-benefit calculations. Much of the production of statistics was part and parcel of techniques of government since the beginning of political arithmetic, population statistics and social statistics including epidemiological studies. At the same time though, health-related statistics can open up a space for public debate on health as a societal issue in novel ways.⁵⁹ It is in this “triangle” of applied health research, EU policy and bureaucracy and health governance through the participation of citizens that the contemporary *Homo Europaeus* is configured. The mode of accountability and concepts of citizenship that include “active” bi-participation, however, entail at the same time rather “passive” subject positions. In an opening statement too the website by the “Directorate for Health and Consumers” of the European Commission this reads: “Our job is to help make Europe’s citizens healthier, safer and more confident.”⁶⁰

58 For the creation of a common space through methods harmonization, see: A. Desrosières, Comment fabriquer un espace de commune mesure? Harmonisations des statistiques et réalisme de leurs usages, in: M. Lallement, J. Spurk (eds) *Stratégies de la comparaison internationale*, Paris 2003, pp. 151-166.

59 For an analysis of statistics as a space for public debate, see: A. Desrosières, *The Politics of Large Numbers. A History of Statistical Reasoning*, Cambridge 1988; S. Bauer, Transparency or surveillance? The datascares of European public health statistics, in: C. Reiche, A. Sick; *Do not exist. Women, Europe, Digital Medium*. Bremen 2008, pp. 189-203.

60 http://ec.europa.eu/dgs/health_consumer/whoware_en.htm (accessed 28 July 2009).

Conclusions

This article has looked at settings and practices of epidemiological research in the field of nutrition and health as a contemporary site in which the *Homo Europaeus* is co-produced and negotiated. Rather than following preconceived notions of a “European,” we have focused on the processes through which the “European” becomes a performative category in contemporary biomedical science and in public health policies. In this context, the epidemiological study itself and its design – an observational cohort study – is a powerful actant: the study design is an infrastructural device and epistemic grid that co-determines the kinds of epistemological and social relations that are possible between researchers and those researched within this setting. With its rules of observation and bio-statistical “requirements,” the study co-organizes this relationship – in epistemological, practical and social terms.

It is through the epidemiological study on nutrition and health that the emergence of the “European” takes place: The research platform and infrastructure is “EUropean” in terms of its organization; moreover, the “European” is performed, when a “European” study population is established, or a “European” repository of biological samples, *i.e.*, when parts of the population function as the extended laboratory for biomedical research. Health scientists use this European datascape⁶¹ to measure, calculate, visualize, and eventually govern diversity. While the “European” as a fixed biological category only emerges in the comparison with the “non-European,” much of the reconfigurations of the European take place in implicit ways – through the ways in which patients are subjected to individual profiling and engaged in risk assessment in treatment decisions. Furthermore, it is also via the epidemiological study that the *Homo Europaeus* is constituted as a citizen both in the mode of the risk manager and bioparticipant. Heterogeneity and difference are made use of as a resource for knowledge production. It is precisely the establishment of databases that bring about Europe as unified in diversity – as a space of harmonized data generation.

Thus, the contemporary European is constituted as a data producer and data consumer – risk manager, bioparticipant, citizen-patient – in a society that is co-shaped by regimes and practices of risk assessment in terms of its culture of decision-making and preventive risk optimization. Increasingly, the consumers themselves ask for evaluations of population health. Beyond being a target population for health policies and governance by the EU and national governments, this “confident” *Homo Europaeus* actively enrolls into research and the improvement of “population health.” The ubiquity of risk assessment rationality and ideas about accountable, evidence-based policy-making as well as a new mode of “bioparticipation” co-shape the contemporary features of the *Homo EUropaeus*.

61 For the use of the term “scapes,” see: A. Appadurai: *Modernity At Large: Cultural Dimensions of Globalization*. Minneapolis 1996.