Even now, at the beginning of the 21st century, work is the basis of material existence for the majority of the population. Occupational activity is the source of social status, power, self-esteem, and success. It has long been recognized that work is important not only in the social setting, but also for the health of the individual. Sigmund Freud even defined health in a way that was largely dependent on work (“Health is the ability to love and to work”). Whether work makes the individual healthy or ill depends, among other things, on specific working conditions such as difficulty, intensity, hours, and organization of work, the degree of fit between demands and abilities, and the individual’s own experiential world and value system. A health-oriented assessment of unemployment lays the emphasis on certain clearly pathological aspects (1–3). On the basis of a selective review of the literature, we will here present the current state of scientific knowledge about the negative effects of unemployment on health and the possible implications from the point of view of social medicine.

**Definition and prevalence of unemployment**
There is no generally accepted, international definition of unemployment, nor is there any uniform method of collecting data on its prevalence. In 2000, the International Labor Organization (ILO) defined the unemployed as persons who are not gainfully employed but are available to the labor market and are searching for work. In Germany, the applicable definitions are contained in the legal enactments of §16 SGB and § 17 SGB III (Social Law Code III – Promotion of Work) (see box 1). The long-term unemployed (§ 18 SGB III) are persons who have been unemployed for at least 1 year. The young unemployed, according to the German Labor Agency, are unemployed people under the age of 25 (“U 25”) (3–5). In August 2007, about 3.7 million persons were unemployed in Germany, among whom...
1.3 million had been unemployed for more than 1 year (box 2). Unemployment affects all social and educational strata and all age groups (4, 6). Despite the currently relatively open labor market, the overall German unemployment rate now stands at 8.8% (August 2007). The unemployment rate in what used to be East Germany is 14.7%, more than twice as high as in the rest of the country (7.3%). There is also a north-south gradient, with the highest unemployment rate in the state of Mecklenburg-Western Pomerania (18.2%) and the lowest rates in Baden-Württemberg (4.9%) and Bavaria (5.1%). The ILO estimates that more than 400 million persons are unemployed worldwide (4, 5). The causes of unemployment are many. It is partly due to inadequate demand occasioned by changes in the working world, in society, and in values. Other factors include increasing globalization, heightened competition and pressure to control costs, lack of individual motivation to work, insufficient qualifications, and ineffective mediation of jobs to the unemployed.

**Unemployment as a danger to health**
As early as 1933, the Viennese sociologist Marie Jahoda (1907–2001) described in her study “Die Arbeitslosen von Marienthal” (“The Unemployed of Marienthal”) the social and health consequences of prolonged unemployment after the closure of a textile factory in a village in Lower Austria (7). Individuals cope better or worse with unemployment...
depending on many different moderator variables, including the duration of unemployment, age, sex, financial resources, education/occupational qualifications, personality structure, causal attribution, social support ("networks"), health problems, health-related behavior, job-seeking behavior, and other activities such as hobbies, volunteer work, or black-market labor (3, 5, 7, 8). The duration of unemployment, in particular, has a major effect on the health-related well-being of the unemployed. Thus, the German Institute for Economic Research (Deutsches Institut für Wirtschaftsforschung) reported that, according to data collected by its Socioeconomic Panel in 2005, the level of satisfaction with one's current way of living was just as low among long-term unemployed persons as it was among persons dependent on nursing care. Dissatisfaction has risen in the past 10 years as well (9).

A telephone survey on health conducted by the Robert Koch Institute in 2003 revealed that the long-term unemployed not only rate their health as poor, but also report a higher frequency of overt illnesses (10). As far as gender is concerned, the adverse effects of unemployment on women's health were probably underestimated in the past, because of traditional role expectations. More recent research reveals no significant differences in health-related vulnerability due to unemployment in men and women, likely because the careers and professional orientation of men and women have become much more similar than they used to be (5, 10). The findings with regard to age, however, are not entirely consistent. The ill effects of unemployment among the young have been emphasized, as have its ill effects among 35- to 44-year-olds, who are thought to be under maximum emotional stress because their orientation toward gainful employment is the strongest (8). On the other hand, recent research from the USA shows that 51- to 61-year-olds who involuntarily lose their jobs are subject to an especially high health risk, including higher rates of myocardial infarction, stroke, and depressive disorders (11, 12, 13).

**Unemployment and health: selection or causation?**

The question whether unemployment causes illness (the "causality hypothesis") or vice versa (the "selection hypothesis") has still not been definitively answered. In individual cases, unemployment can be both the effect and the cause, or one of the causes, of illness ("duality") (3, 14, 15). Evidence in favor of the selection hypothesis comes from the fact

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**BOX 3**

**Effects on social life**

- Loss of social contacts (social isolation)
- Lack of time structure / lack of structure of daily activities
- Financial problems, indebtedness
- Poor living environment (noise, pollution, "ghettoization," impending homelessness)
- Increased conflict within the family (domestic violence, partnership-/sexuality problems)
- Intergenerational effects (loss of self-esteem/higher suicide rates among the children of the unemployed)

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**BOX 4**

**Lifestyle and health behavior**

- Increased consumption of alcohol, nicotine, and illicit drugs
- Poor nutrition (overweight, undernourishment, over-reliance on "cheap food")
- Physical inactivity ("Play Station syndrome")
- Altered sleep habits (sleep deficit, abnormal sleep rhythm)
- Increased risk of accidents
that about one-third of all terminations of employment in the 1980s and 1990s were illness-related; according to the telephone survey of health conducted in 2003, about one-quarter of all unemployed men had lost their jobs because of illness. According to the statistics of the German Federal Labor Agency, about 25% of all unemployed persons, 40% of those above 50 years old, and 50% of the long-term unemployed ( > 12 months) have health impairments that lessen their ability to get a new job (4, 5, 9, 14). In an evaluation of 310 048 medical examinations performed by the Federal Labor Agency's Medical Service, Hollederer found that 42% of the unemployed suffered from musculoskeletal conditions and 25% from mental illness (15). Among the persons undergoing retraining for health reasons in German occupational rehabilitation centers in 2003, about 75% were unemployed, and 50% of these had been unemployed for more than 1 year (16). A not inconsiderable number of the unemployed suffer from serious objective impairments of health. Among the 4.8 million persons registered as unemployed in Germany in 2005 (an average figure for the year), 191 000 were classified as severely handicapped as defined by German law (SGB IX). The number of severely handicapped persons in the overall population is about 6.8 million (4). There are also, however, many studies that support the hypothesis that unemployment causes illness (5, 17). These can be classified by their methodology into two types: macrostudies are based on aggregate data, while microstudies are based on individual data.

In macrostudies, the unemployment rate in various areas is matched against mortality figures (for example) in the same areas, even though there is no way of knowing whether the persons who died were the same as those who suffered the stress of unemployment. In contrast, microstudies involve cross-sectional or longitudinal assessment of data obtained from individuals on the basis of their occupational status. Cross-sectional ("snapshot") studies do not permit any causal inferences to be made. Thus, longitudinal studies based on individual data are considered the gold standard for research on unemployment and health. Such studies take account of data concerning the periods before and after the individual becomes unemployed, as well as further data on the acquisition of new jobs and on important confounding variables. Unfortunately, only a few studies are of high methodological quality (5, 15, 17). The causality hypothesis, therefore, requires further support from secondary data analyses, for example, statistical studies performed by health insurance carriers and data from health surveys (10, 14). The health-related target parameters of studies on the negative effects of unemployment usually include subjective well-being, changes in social life, health behavior, use of medical services (care provision), mental and/or physical morbidity, and (premature) mortality (3, 5, 10, 14).

**How does unemployment make people ill?**

The possible pathogenetic mechanisms of unemployment that are currently under discussion include the stress model, health-damaging individual behavior (a risky lifestyle), the deprivation theory, and the "vitamin model," which relates to socioeconomic deficits.

Stress theory considers unemployment to be a strong social stressor leading to emotional, mental-cognitive, behavioral, pathophysiological, and biochemical reactions. Neuroendocrine, metabolic, and immunological parameters play a large role in this model, including elevated cortisol and cholesterol levels, pathological glucose tolerance, high blood pressure, and a cellular immune deficiency. Further important pathogenetic factors include stress-related emotional problems, such as anxiety and resignation, and health-damaging individual behavior, such as excessive consumption of alcohol or nicotine as an inappropriate coping strategy. These changes are interpreted as risk factors for, or preliminary stages of, overt illnesses, in particular cardiovascular diseases such as hypertension, myocardial infarction and stroke and psychosomatic conditions such as depression and anxiety disorders. Both groups of illnesses can be thought of, to some extent, as a "final common pathway" of chronic psychosocial stress in individuals whose coping mechanisms are deficient. This mechanism is biologically plausible (1, 3, 5, 8, 17).

The deprivation theory and the "vitamin model," on the other hand, are mainly concerned with the psychosocial consequences of unemployment. Certain functions of gainful work, including the earning of money, structured time, social contact, status, identity, regular activity, and environmental factors, are held to be important prerequisites for emotional well-being and mental stability that are significantly impaired by unemployment. There is also good empirical evidence that low income and a reduced standard of living are correlated...
with impaired mental health (18). The major sociopathogenic factors causing impairment of social health due to unemployment are financial deficits, stigmatization, role changes, social isolation, and time restructuring (8). Beyond these pathogenetic considerations, the negative health effects of unemployment can manifest themselves multidimensionally, especially with respect to social life, lifestyle/health behavior, psychosomatic morbidity, the use of medical services, and mortality.

**Social life and lifestyle**

Unemployment affects social life mainly by reducing the individual’s social contacts and financial resources, leading to problems such as indebtedness. Thus, unemployment was chosen as a major topic of the annual meeting of the German Medical Association in 2005 in view of its being the most important factor for the spread of poverty in Germany. The negative effects of unemployment on social life, especially among long-term unemployed persons, are summarized in *box 3* (5, 19). The modes of behavior listed in *box 4* (5, 8, 14, 17, 20) are held to be established risk factors for the acquisition of so-called diseases of civilization. Certain somatic illnesses are found to be correlated with unemployment and usually also with a lifestyle that puts the individual at greater risk: these include coronary heart disease, arterial hypertension, stroke, chronic bronchitis, metabolic syndrome, and fatty liver and hepatic cirrhosis (17).

**Morbidity**

The somatic illnesses most closely associated with unemployment are obesity, metabolic disorders, and cardiovascular diseases, including arterial hypertension (sometimes of questionable clinical significance) as well as coronary heart disease, myocardial infarction, cerebrovascular insufficiency with stroke, and peripheral arterial occlusive disease (17, 21). Further objectified diseases are listed in *box 5*. The abnormalities described have often been found in combination with a health-endangering lifestyle; thus, the potentially damaging effect of unemployment on these organ systems should be seen in the context of behavioral risks (5, 17, 22). Many methodologically sound studies, and three meta-analyses, have now confirmed beyond any doubt that mental and psychosomatic illnesses can be caused by unemployment (5, 14, 18, 22, 23, 24). Moreover, one can even discern a dose-related effect: not only does continued unemployment lead to an increase of mental symptoms, but the resumption of work also leads to improvement in mental well-being (5, 8, 10, 18). The types of mental disturbances discussed in the literature include low self-esteem, helplessness and hopelessness, isolation/loneliness, resignation, apathy, headache, sleep disturbances, chronic fatigue, irritability, and aggression (3, 5, 14). In addition, the unemployed have also been found to have a higher frequency of serious mental health problems including depression and anxiety disorders, addiction, and suicidal behavior (3, 14, 22).

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**Box 5**

**Unemployment and somatic illnesses**

- Obesity
- Lipid and carbohydrate metabolic disturbances
- Metabolic syndrome, type 2 diabetes mellitus
- Arterial hypertension
- Coronary heart disease (myocardial infarction)
- Stroke
- Peripheral arterial occlusive disease
- Gastrointestinal symptoms (e.g., gastritis, ulcers, irritable bowel syndrome)
- Hepatic disorders (e.g., fatty liver, hepatic cirrhosis)
- Immune suppression (e.g., frequent infections)
- Respiratory diseases (e.g., chronic obstructive pulmonary disease)
- Malignant neoplasia (e.g., bronchial carcinoma)

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Use of medical services

The increased incidence of mental disorders among the unemployed is also reflected in the statistical findings of the German health insurance carriers concerning the use of medical services. The number of days of inability to work due to mental illness (ICD-10 diagnosis group F) among the unemployed has been rising for years. Their average number of days of inability to work per year (22 days) is also higher than that of the employed (13 days) (1, 2, 14). Furthermore, the 1998 German Federal Health Survey (Bundesgesundheitssurvey) revealed that the unemployed consult physicians in private practice more often than the employed. An evaluation of the data obtained by one insurance carrier, the Gmünder Ersatzkasse (GEK), showed that unemployed men and women are also more frequently admitted as inpatients to acute-care hospitals than employed persons are. The single most common diagnosis among the unemployed persons insured by GEK was alcoholism (14).

Mortality

As early as the 1970’s, Brenner reported several macrostudies that showed an elevated risk of premature death associated with unemployment (25). Though such observations were made in multiple further studies, the design of these studies permitted no causal inferences to be made (17, 21). Grobe, evaluating the individual data of GEK, found an elevated risk of death that depended on the duration of unemployment: persons insured by GEK who had been unemployed for less than two years had a relative mortality of 1.6 compared to persons who were continually employed, while those unemployed for more than two years had a relative mortality of 3.4 (14).

Conclusions and prospects

The major effect of unemployment is to impair psychosocial health. There is strong evidence for the validity of the causality hypothesis (3, 5, 10, 14, 18, 24). The evidence is reinforced by consistent data, the occurrence of dose-related effects, and long-term observation. In contrast, the direct causation of somatic illness by unemployment is less well documented. Significant in this context is the fact that the unemployed behave in health-damaging ways more commonly than the employed (17).

In the globalized service economy, new psychosocial stressors are taking on increasing importance, such as the fear of unemployment, job insecurity, downsizing, worsening conditions in the workplace, or poverty despite employment. The health effects of these stressors are certainly comparable with those of unemployment itself (box 6). From the scientific point of view, there is an unaltered need for methodologically sound longitudinal studies not just of pathogenetic mechanisms, but also of “salutogenic,” that is, protective ones. The lack of knowledge in this area does not lessen society’s duty to be committed to the

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**BOX 6**

**Effects of job insecurity and downsizing**

- Sleep disturbances
- Depression and anxiety disorders
- "Internal unemployment" - loss of emotional connection to one’s job
- Increased incidence of work accidents
- Increased use of medical services
- High blood pressure
- Obesity
- Increased nicotine consumption

- Among persons who do not lose their jobs, there is, at first, relief; this can be followed by anger, frustration, helplessness, sadness, anxiety for the future, and resignation.
prevention of illness and to the rehabilitation of those in need of it. Important types of intervention include "preventive reintegration," that is, the prevention of job loss, and the finding of a new job as soon as possible for those who become unemployed. In many cases, these things will be able to be done effectively only if there is a change in the mentality of employers and employees, and of the employees’ treating physicians as well. "Company-level reintegration management" ("betriebliches Eingliedermansagement," BEM), a concept incorporated in current German labor law (SGB IX § 84 Para. 2), may open up new possibilities here (1, 2, 5).

Once an individual loses his or her job, efforts should be made not just toward rapid reintegration through retraining and optimal help with job placement, but also toward preventing or at least lessening the negative health consequences of (potentially long-term) unemployment. Important areas that can be addressed here include reinforcement of self-esteem, avoidance of social isolation, regular physical exercise, a balanced diet, and prevention of addiction. Persons who have never been in a regular work situation in their lives can have difficulty in acquiring even the most basic prerequisites for gainful employment, for example, time structuring, discipline, perseverance, and reliability. Moreover, a number of specific programs to promote reintegration are currently being planned or already being tested: examples include the "AmigA" project for work promotion with integrated health management in the state of Brandenburg, the "Job-Fit NRW" in North Rhine-Westphalia, and the "Job Train" program of the occupational rehabilitation centers (3, 5). Experts in the labor market currently predict that mass unemployment will continue to be a reality in Germany over the next decade. Thus, the coming years will presumably see increased nationwide discussion of the importance of gainful employment in the framework of the German Social Insurance scheme, as well as of alternative opportunities for the unemployed to participate in the life of society.

Conflict of Interest Statement
The authors state that they have no conflict of interest as defined by the guidelines of the International Committee of Medical Journal Editors.

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