Upcoming demographic challenges in Europe: The urgency to better manage dementia

Dr. Hans Groth

Visiting Lecturer on Demography and Health, University of St. Gallen, St. Gallen, Switzerland

Member of the Board of Directors, Pfizer Switzerland, Zürich, Switzerland

Demographic change and ageing is silently and steadily taking place all over the Western world. By 2030, people aged 80 years and above, for example, will represent 6-8% of the French, Spanish, British, German and, even 12% of the Japanese, populations, compared to only 4-5% in 2010. Another example can be found in Switzerland, where the dependency ratio (retired divided by working populations) will continue to increase from 25% in 2005 to 44% in 2030. In Japan, this ratio will rise from 28% in 2000 to 53% in 2030. Even the number of "very" senior citizens will explode: in 2007, there were 443 persons aged 105 years and above in Germany, compared to only 243 in 2000.

This continuous increase in longevity gained momentum already in the early nineteenth century as a result of socio-economic progress arising from improvements, for example, in hygiene, nutrition, the water supply, healthcare, and health literacy; this contrasts to a continuous decline in birth rates which is beyond replacement level. If we take again Germany as a case in point for Europe as a whole, birth rates per woman have steadily declined from around 2 in 1970 (equal to more or less replacement level) to 1.2 at present, thereby aggravating the socio-economic challenges inherent within a growing elderly population in relation to a shrinking younger supporting and working adult population.

It can be deemed obvious, that ageing goes hand in hand with surging healthcare expenditures, as higher age is closely interrelated with an increasing number of chronic diseases. On average, males who are 80 years and above have 3.4 diagnoses and females 3.6 diagnoses, rising from

1.3 diagnoses respectively between the ages of 20-39. This multi-morbidity phenomenon is one of the major reasons for an almost exponential increase in health expenditures over an individual's lifetime.

The major chronic disorders, which are particularly age-related and increasingly shape each country's healthcare bill, are:

- Dementia and depression
- Chronic musculoskeletal disorders/falls
- Chronic arthritic diseases
- Cardiovascular diseases
- Cancer
- Sensory disorders (impairment of sight, hearing, taste, etc.)

Among these age-related diseases, dementia is the one with the greatest impact on an individual's quality of life, the level of burden on the family and financing from either private or public sources. Its prevalence is strictly age-related and, according to German data, increases from 5% between the ages of 65-69 to 50% at the age of 90 years and above. Comparable figures are reported from Switzerland: its prevalence is 3% in the age group of 65-69 year olds, and 36% in the group aged between 85-93 years.

The ongoing ageing evident in Western societies will inevitably lead to the growing prevalence of dementia. In 2008, there were 64,000 persons aged 80 and above with dementia in Switzerland (< 1% of the population), and this figure is predicted to rise to 161,000 in 2050. This translates into 2.3% of the population and is a consequence of this age group increasing from 344,000 in 2008 to 874,000 in 2050 (forecast based on a constant population size of 7 million).

In the US, the prevalence of patients with Alzheimer's disease will increase from about 5 million in 2010 to 8.5 million in 2030 or from 1.6% to 2.3% of all people living in the US. In Japan, where an even more pronounced ageing society is already evident today, the estimated number of

dementia patients will increase from about 2 million at present to 4 million in 2040. While currently, 1.6% of the population are affected, this proportion will more than double to 3.6% in the coming 30 years.

It is extremely apparent that this highly prominent age-related disease will result in a serious stress on any social welfare system and its economy at large. The degree of this stress, however, will essentially depend on the efficacy and safety of the future preventative and therapeutic intervention options available. At present, pharmacological dementia treatment is focused on the limited effectiveness of neurotransmitter-modulating medicines, mainly cholinesterase inhibitors such as rivastigmin, galantamine or donezepil; the more severe cases are treated with the NMDA glutamate receptor blocker memantine. As the benefits of these medicines are not long lasting and only postpone the symptomatic progress of the disease by just 6-12 months, serious preclinical research efforts to target the disease pathology at a more basic stage are presently being undertaken by numerous pharmaceutical companies and even more by major academic centers. Novel approaches include Tau aggregation inhibition, amyloid beta aggregation inhibition, RAGE inhibition, microtubule stabilization, gamma-secretase modulation, just to name a few of the targets currently under investigation. Nevertheless, there are only about 200 ongoing clinical trials to test new dementia drugs, a figure which appears minute when compared to the 1,300 plus trials which are currently ongoing in the diabetes area. This finding highlights that the translation of basic science into clinical benefits in the CNS/dementia research is still far away from being at a level, which can be classified as broadly successful when compared to other more intensive research fields such as pain or diabetes (as referred to above).

The broader socio-economic impact of the dementia problem is immense. For Switzerland, it is assumed that the increase in nursing costs for this condition alone will be between 1.6 and 7 billion CHF from 2008 to 2050, depending on the severity of the disease. For the US, it is projected that this condition already costs over 160 billion USD annually, and is showing a tendency of rising at a steady rate. Today, there is already a shortage evident in the US in the supply of key services involving care givers for dementia patients; home support is only available

to 44% of patients, day care to 42% and residential/nursing home care to 34%. This problem is aggravated even more by the future shortage of care givers: a recent study estimated for Switzerland that between 120,000 and 190,000 new persons will need to be recruited by 2030 to replace the retired care givers (two-thirds) or compensate for the increased demand due to the ageing population.

At present, the only way to alleviate this situation appears to lie in utilizing preventative measures to reduce the incidence of dementia. Even at present, prevention is possible and effective if vascular components of dementia are aggressively targeted through the treatment of vascular risk factors such as hypertension, diabetes, dyslipemia and life style modifications (e.g. smoking cessation, weight loss, exercise). As the contribution of vascular components to dementia is increasingly considered to be fundamental, even in the most prevalent etiology - Alzheimer's disease, preventative cardiovascular measures appear to be a very appealing option. However, the prevention and treatment of neurodegenerative processes in Alzheimer's disease remain as unmet medical needs of the highest priority. Thus, all means to increase preclinical/clinical research, clinical guidelines and especially translational efforts need to be intensified and brought to new standards of excellence.

If the growing dementia challenge is not tackled, extended longevity may no longer remain desirable for coming generations and this could turn out to be the source of a new type of societal conflict.

ヨーロッパにおける来るべき人口問題：
認知症老人ケア改善の緊急性

Hans Groth 博士（M.D.,Ph.D.）
University of St.Gallen,客員教授,経済学名誉教授
Pfizer Switzerland,取締役

人口動態の変化や加齢は静かに確実に西洋のいたるところで起こっている。

2030年までには例えば80歳かそれ以上の高齢者は2010年においては人口の4-5%であるのに対し、フランス、スペイン、イギリス、ドイツにおいては人口の6-8%、日本においては12%をも占めるようになるであろう。

高齢化はスイスでも起こっており、依存人口比率（退職者を労働人口で割った数値）は継続して増加し2005年の25%が2030年には44%になる。日本において依存人口比率は2000年の28%が2030年には53%になるといわれている。超高齢者の数も大幅に増えるであろう：ドイツにおいて105歳かそれ以上の超高齢者は2000年では243人のみだったのに対し、2007年では443人が超高齢者であった。

この継続的な寿命の伸びは19世紀初期の衛生・栄養・水道供給・医療や医療知識などの向上による社会経済の進歩により、すでに勢いをつけていた：これに対し出産率は人口置換水準に満たないレベルにまで下降している。ヨーロッパの例としてドイツをあげて説明すると、女性の出産率は徐々に1970年の2（だいたい人口置換水準と同じ水準）から現在の1.2まで下降し、高齢者人口が労働人口に対して増えることで発生するさまざまな社会経済の問題を悪化させている。

年をとると医療費が高くなるのは高齢と慢性疾患の増加との密接な相関関係からみても当然だとみなすことができる。平均的な80歳以上の男性は3.5、女性は3.6個の病気を患っており、20-39歳のそれぞれ1.3個よりも増えている。この複数の病気にかかるという現象が年ととるほど医療費が高くなる主な理由である。

以下が特に年齢と関連性があり各国の医療費への影響が大きくなっているものである。

・認知症と鬱

・慢性筋骨格異常

・慢性関節炎疾患

・心臓血管疾患

・ガン

・感覚疾患（視覚、聴覚、味覚などの障害）

これらの病気の中でも認知症は個人の生活の質、家族への負担、そして資金調達の面からも最も影響が強いものである。認知症の有病率は非常に年齢と関係しており、ドイツのデータによると、65歳から69歳では5%である有病率が90歳を超えると50%になる。同じようなデータがスイスからも報告されている:スイスでは65歳から69歳の人口グループでは3%の有病率が85歳から93歳のグループでは36%であった。

現在西側諸国での明らかな高齢化が認知症の有病率の増加につながることは必死である。2008年のスイスでは認知症を持つ80歳以上の高齢者は64000人だが（人口の1%以下)、それが2050年には161000人に増加すると予測されている。これは人口の2.3%に匹敵する数値で、80歳以上の高齢者グループが2008年から2050年の間に344000人から874000人に増加するためである（700万 人の人口からの予測)。

アメリカではアルツハイマー病の患者が2010年の5万人から2030年には8.5万人、言い換えると有病率がアメリカの全人口の1.6%から2.3%に増えると見られている。高齢化がさらに顕著な日本においては認知症の患者は現在の2百万人から2040年には4百万人に増加すると予測されている。日本では現在人口の1.6%が認知症であるが、今後30年でこの数字は倍以上の3.6%になるとされている。

この年齢と関連して起こる病気が、国の社会福祉システム、さらには経済全体を圧迫させることは明白である。しかしながら、どの程度圧迫させるかについては将来において活用可能な予防法や治療法の効果や安全性にかかっている。現在のところ、薬理学的な認知症の治療はリバスチ

グミン、ガランタミンやドネゼピルなどのコリンエステラーゼ阻害薬を中心とする神経伝達物質調節薬の限定的な有効性にフォーカスしている:より重症な症例の治療にはＮＭＤＡグルタミン酸受容体阻害薬のメマンティンが使われる。これらの薬の効果は長く続かず症状の進行を 6-12 ヶ月ほど遅れさせるだけであるため、もっと基礎的な段階での病態をターゲットにした前臨床研究が、現在数々の製薬会社やそれ以上に多くの学術機関によって進められている。新しいアプローチとしてタウ凝集抑制、アミロイドベータ凝集抑制、ＲＡＧＥ（終末糖化産物受容体）抑制、微小管安定化、ガンマセクレターゼ調節があげられ、これ以外にも多くの研究がされている。それにもかかわらず、現在行われている認知症の新しい治療薬の臨床試験は 200 程度で、糖尿病では 1300 もの臨床試験が行われていることと比較するとかなり少ない。このことは（上記で述べたように）より盛んに行われている痛みや糖尿病に関する研究と比較していかに中枢/認知症研究が基礎科学を臨床における成功につなげる段階とはほど遠いところにいるかというのをうきぼりにしている。

認知症が社会経済全体に及ぼす影響ははかり知れない。スイスでは 2008 年から 2050 年の間で認知症のみで介護費用が重症度により 16 から 70 億スイスフラン上昇すると予測されている。アメリカにおいては認知症にすでに毎年 1600 億ドルを費やしており、また将来認知症は着実に上昇する傾向を見せている。現段階ですでに認知症を介護する人に対する重要なサービスの不足がアメリカにおいて明るみになっている：在宅サポートを利用できるのは患者の 44%のみでデイケアにおいては４２%、養護施設においては 35%しか利用できない。この問題は将来介護者が減ることでより悪化してしまう：最近の研究によるとスイスが 2030 年までに退職してしまう介護者(2/3)や高齢化する人口に対応するためには 120000 から 190000 人の新しい人口が必要であると予測されている。

現在のところ、認知症による問題を軽減するには認知症が発生しないように予防策を講じることが唯一の方法であるように思われる。現段階でも、高血圧や糖尿病、ディスリピミアなどの血管性リスクファクターの治療や生活スタイルの改善（例えば禁煙、体重減少、運動）を通し認知症の血管系要素に積極的に働きかけることで認知症を予防することは可能である。血管成分が認知症に根本的に寄与しているとの考えは広がりを見せており、最も発生率の高い病気のアルツハイマー病においても、心臓血管系による予防策の効果が期待されている。しかしながら、アルツ

ハイマー病における神経変性疾患の予防・治療については開発が最優先されるもののまだ見つかっていない。したがって、前臨床および臨床研究、臨床ガイドライン、そして特に基礎研究を臨床医療につなげる努力をより行うためにあらゆる手法を強化・改善する必要がある。

もし認知症の問題が放置されてしまったら、近い将来長寿は望ましいことではなくなり、そのことが新しい社会の対立を生んでしまうかもしれない。

Dr. med. Hans Groth, MBA

- Head Healthcare Policy & Market Access, Established Products Business Unit Pfizer Europe.
- Director Healthcare Policy & Market Access, Pfizer Switzerland

Schärenmoosstrasse 99, CH - 8052 Zürich
Phone: +41 43 495 71 11
Mobile: +41 79 400 48 60
hans.groth@pfizer.com

Dr Hans Groth is Director of Healthcare Policy & Market Access for the Established Products Business Unit, Pfizer Europe and Director of Healthcare Policy & Market Access for Pfizer Switzerland. His responsibilities include healthcare policy, regulatory affairs, strategic pricing and market access management.

Hans Groth studied medicine at the Universities of Freiburg (Germany) and Zurich (Switzerland) and is Board-certified in Internal Medicine. In 1995, he received an MBA from Henley Management College, England.

During the last nineteen years working for the pharmaceutical company Pfizer, he has gained well-rounded global industry experience covering over thirty healthcare markets in Europe, East Europe, U.S.A and Canada. His responsibilities comprise medical marketing, clinical research, global marketing, sales management and negotiating with government agencies and payors.

In 2003, in his capacity as a Pfizer Global Health Fellow, Hans Groth conducted on behalf of UNAIDS, HIV/AIDS/Tbc epidemiological field research in Siberia and Central Asia to quantify the potential threat of these diseases in the region. Since then, he has been supporting on his own initiative two public health infrastructure projects in south Siberia and Kyrgyzstan. As recognition for his commitments, he received in 2008 the Pfizer Global Health Fellow Award.

As both a manager and privately, Hans Groth is interested in the interconnection between health, wealth and economic development, in particular, with respect to the influence of global demographic trends thereon. In 2007, the book "Europe's Demographic Challenge – Unlocking the Value of Health" was published in which he summarized together with the political economist Nicholas Eberstadt his views on the influence of economic, political and cultural factors on health and vice versa. Both authors conclude that an explicit approach to assessing the value of health augments common theories regarding economic development and productivity and thereby opens up possibilities to confidently and successfully meet the challenge of ongoing demographic changes.

As a result of his many years working in different healthcare markets and his societal-political interests, Hans Groth has not only a national, but also a broad worldwide network and is an active member of numerous international working groups.

Hans Groth is married and has two grown children. He has both German and Swiss citizenship.