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THE ECONOMICS OF A DISPARITY: ORAL HEALTH OF SENIOR CITIZENS IN THE UNITED STATES

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Abstract
In health economics, the allocation of scarce resources is not always fair or just. Typically, senior citizens, even with Medicare insurance, must pay deductibles and copays toward their medical and prescription costs. However, the system of application for "supplemental" or "advantage" plans is complex – replete with small print and disclaimers written in complicated lawyers' language. The senior is often recruited into these health insurance plans offering a PPO (Preferred Provider Organization) instead of maintaining straight Medicare insurance. The applicant is in for a surprise when she or he follows the complex journey to a Medicare PPO but finds out they are not always covered for doctors' visits or prescriptions. For example, some outpatient hospital programs do not accept the Medicare PPO, accepting instead only straight Medicare. Furthermore, a second surprise may come at the pharmacy when the senior finds that many needed medications are not covered (i.e., they are not in the plan formulary). The senior citizen, often cognitively impaired due to age, must make these decisions based on very little evidence or literature except that given by the plan provider. This paper focuses on the problem of oral health disparities affecting seniors in the United States – centering on defining existing problems and posing education and prevention as approaches to future solutions.

Introduction
"Health economics" can be defined as the allocation of often scarce resources in meeting the health needs and wellbeing of the members of a group or groups (Hall, 2013). Shane Hall is a writer and research analyst with more than 20 years of experience. His work has appeared in "Brookings Papers on Education Policy," "Population and Development" and various Texas newspapers. Hall has a Doctor of Philosophy in political economy and is a former college instructor of economics and political science.

"Health economics" as applied to seniors in the United States of America (USA) is an important arena of fiscal policy in the consideration of national health care costs. The very young and the very old are the most vulnerable populations for illnesses requiring the highest amount of health care dollars. The economics of senior health care impact most levels of human social organizations including families, communities, cultures, societies, businesses, and governments (Milgrom et al., 2004). Economically-based units of these organizations often allocate their limited resources to meeting the health needs of their populations--including highly impacting the nation's seniors. We live in times of escalating health care costs and subsequent concerns by governments and policymakers about how to reform health care (e.g., "Obamacare" with health insurance for all).

The wellbeing of seniors and the fate of Medicare and Social Security have become key issues within the larger policy arena of health care economics in the USA. Epidemiologically, seniors represent the largest demographic group in the USA with increasing demands for health care services (Pyle & Stoller, 2003). The maintenance of oral health by seniors is the key to successful health care and a focus for positive health economic policy. Studies have revealed that over 25% of seniors over 50 years old had poor oral health (Northridge et al., 2012a). This situation was exaggerated in rural residents as compared to urban dwellers (Vargas et al., 2003). In addition, seniors in the USA are the leading group at risk for oral and dental disease (Pyle & Stoller, 2003). There are wide disparities in the provision of oral care services in the USA between the mid-to-upper economic classes and patients of lower socio-economic status (SES). This inequity of oral services provision is especially evident when considering seniors in the lower SES groups in the USA (Northridge et al., 2012b).

Usually based upon economic conditions, severe health care disparities occur in many populations (e.g., often based on demographic differences or country/regional borders). Typically, the wealthy can afford insurance and will seek oral health care when needed. However, the large cohort of low SES seniors generally cannot afford and may not seek needed oral health care (even for severe pain or infection). Disparities in oral care for senior Americans in terms of enablers and barriers are given in Table 1.

Advanced age is a barrier to oral health--for example, long-term hospitalizations or assisted-living (Kiyak & Reichmuth, 2005).
Minority status is a barrier to oral care in seniors (SGROH, 2000).
Oral care for seniors is enabled by increased education of health care personnel (CDC, 2003).
Higher income is a strong enabler of oral health care (ADA, 2013).
Greater availability of health insurance to seniors is an enabler (Kiyak & Reichmuth, 2005).
Rural residency of seniors is a barrier to oral care as compared to urban dwellers (Vargas et al., 2003).
Geography and logistics may create barriers to senior oral health (CDC, 2003).
Impaired functional abilities in seniors are barriers to oral health care, e.g. epilepsy or wheelchairs (Kiyak & Reichmuth, 2005).
Systemic diseases may be barriers to receiving oral health care (Scully & Ettinger, 2007).
Lower SES is a barrier to the treatment of oral disease in seniors (Hobdell et al., 2003).
Oral health care of seniors can be enabled by community-wide or political involvement (Milgrom et al., 2004).

Table 1: Enablers and Barriers in Oral Health Care for Senior Americans

Functions of the Oral Apparatus

Directly or indirectly, the oral cavity is central to most of the body's vital functions and processes. It is the oral cavity that is initially responsible for mastication, digestion, transportation, and immunity. In the masticatory process, chewing food allows for proper digestion. Salivary enzymes digest carbohydrates and simple lipids. The function of transportation brings food from outside world to the esophagus and stomach. The tonsils provide immune protection against invading bacteria from the outside world. Many of the initial symptoms of several illnesses impact the oral cavity (Varicella, Kaposi's sarcoma). Symptoms of early disease like erythema, inflammation, xerostomia, ulceration, and formation of vesicles and pustules are commonly found in and around the oral cavity. The processes described below foster the argument defining the oral cavity as central to the body's functions and overall health (Healthy People, 2020):

Oral Ingestion

The ingestion of foods (as solids or liquids) from the environment is the first step in the digestive process. Chewing the food, with the aid of orally-secreted saliva is the next step in digestion. Digestive action on food continues by shaping of a bolus by the oral apparatus as it moves on into the esophagus. The mouth has numerous salivary glands that function in the lubrication of the food bolus and augmentation of taste. Different areas of the oral cavity (especially the

tongue) contain taste buds functioning to sense a gradation of oral stimuli (e.g., the arraignment of sweet to sour taste buds on the tongue). The oral cavity is also the site of the sensing of the relative hot or cold nature of foodstuffs or drinks.

The administration route of most medicines and drugs into the body is by oral ingestion (per os). Local anesthetics (e.g., Lidocaine, Benzocaine) are used orally in dentistry by injection or topical application. Intra-oral medications such as Nitroglycerin (used for the treatment of Angina) are administered by the sublingual route (sl). Some rinses are medicinally active such as Chlorhexidine (periodontal rinse) or ACT (anti-cavity fluoride rinse). In addition, salt water or hydrogen peroxide may be used as mouth rinses for their antibacterial and soothing effects.

Many patients use antiseptic, alcohol containing mouthwashes (i.e., ethanol) of which many researchers question the risk and safety. Although research is conflicting on the cancer-causing activity of the chronic use of alcohol containing mouthwashes, it appears that the benefits of plaque and freshening control do not exceed the risk of using alcohol as an ingredient in mouthwash (Werner & Seymour, 2009). The consumption of alcoholic beverages has both negative and positive effects on the human body. From a positive standpoint, chronic use of alcohol leads to a beneficial "thinning" effect on the blood (i.e., increasing clotting time). This "thinning" effect of alcohol use may aid in the prevention of heart attacks and strokes. In addition, the behavioral effects of alcohol can lead to risky negative activities (e.g., such as driving under the influence or as a "gateway" to experimentation with other drugs).

Oral Physiology

Physiological and psychological feelings of hunger and thirst govern ingestion into the gastrointestinal system. Humans can go without food for extended periods, but water intake (i.e. fluids) is essential. The typical oral intake of liquids maintains the blood flow of the circulatory system and fluid balance of the body—primarily osmotic balancing at the cellular level. The circulation of blood in the body distributes nutrients, medicines, and other materials. The flow of blood also allows for the distribution of gases throughout the body (i.e., usually expressed as partial pressures of primarily oxygen and carbon dioxide). In addition to its nutritive functions, the blood circulation acts as a vehicle for internal bodily communication--largely in the form of the hormonal and immune systems.

Communication

Non-verbal communications may be based on upon bodily movements, facial expressions, or in conjunction with electronic media like computers, e-mails, or faxes. Facial and bodily expression usually predominate non-verbal communication. The "muscles of facial expression" and to a lesser degree, the "muscles of mastication" are employed in concert for human communication. . Humans are communicating creatures requiring the communication process that is the combination of words, sounds, expressions, and body language mostly with her or his orofacial apparatus. As well as production of the message by the sender, communication transfer always requires the presence of a recipient. A common theoretical example of recipient-based communication is that if a tree falls in the forest and there in no recipient to hear it fall, then no communication transfer has occurred.

Facial Contours

Teeth, bones, and oral soft tissues support musculature and structural contours allowing for the distinctive features and expressions of the human face. Attractiveness of the face and oral apparatus are quite desired personal attributes. These features are especially important both

psychologically and socially. For example, the human psyche responds to the "emotive power" of orofacial expression--like the uplifting smile of a pretty girl to an admiring male.

Discussion

The Economy and the Elderly

Poor economic conditions adversely and disproportionately impact the elderly population. High cost-of-living rates among the elderly forces many to work beyond retirement age for low wages. Medicare does not cover dental treatment and state-run Medicaid covers only some dental services for children. Social Security provides only a low income that is insufficient to cover much dental care.

More cooperation and interplay are needed between nations and regions as to the international economic ramifications of health care policy for seniors (e.g., by the European Union, United Nations, or World Bank). We can learn from our global neighbors about health care management, methodology, and the ubiquitous difficulty of using scarce resources in the conduct of patient care for seniors. Focusing on seniors, more shared data and advanced methodology is necessary among disparate sectors on public health, health care issues, and technology (e.g., between research universities and the private pharmaceutical industry). Such technological cooperation is facilitated in an aging modern world by the incorporation of the internet into the practice and administration of health care.

Increasing Population of the Elderly

With the dawn of civilization, humans have been subject to an arithmetically-increasing food supply alongside a geometrically-increasing population rate (Malthusian Theory: An Essay on the Principle of Population, 1798). This ongoing and soaring growth of the human population over time has lead to an increasing birth rate coupled to a decreasing death rate--as exemplified by an increasing population of the elderly.

Modern demographics and overpopulation is due to great advances in medical knowledge and enormous progress in public health preventive measures especially water treatment, and vaccines (Lederberg, 2003). Although developed in the 19th Century to counter the Smallpox virus, wide implementation of vaccination procedures began as an early 20th Century phenomenon used for prevention of disease (e.g., Polio, Influenza). Subsequent 20th Century development of penicillin and other antibiotics were giant steps in health care in treating existing disease. Medical advances today continue to provide seniors with greater access to care, lower costs, and advanced technology (e.g., generic drugs, artificial organs).

Conclusions

Future goals in American health care include expansion of access and treatment for patients with "special needs". Seventy-six million plus baby boomers are in or nearing their 60s, thus the need for geriatric care has been escalating (SGROH, 2000). Aging patients needing oral care with uncomplicated treatment plans, normal medical histories, and those that are functionally manageable can be treated in most clinical settings or in private practices. A flow chart of oral care for seniors emphasizing prevention and health care education is provided in Figure 1.

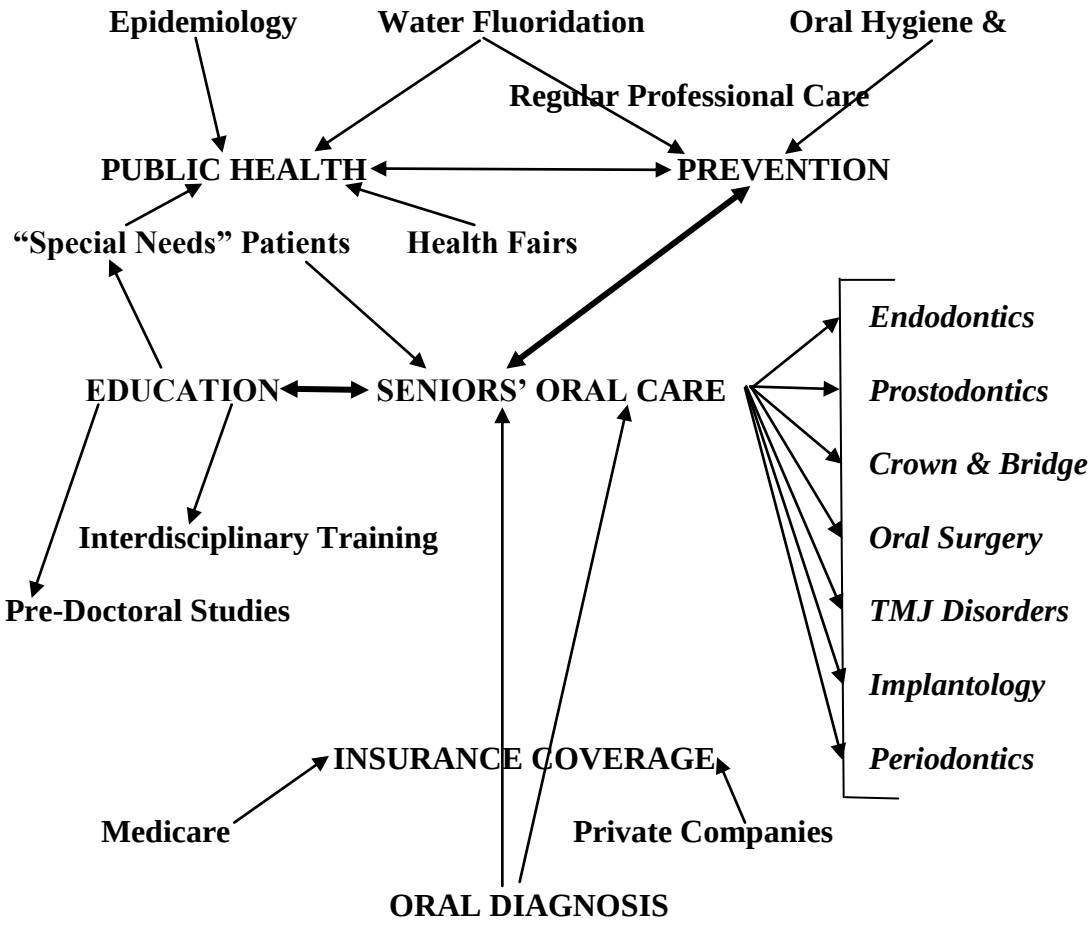

Figure 1: Flow Chart of Senior's Oral Health

Aging "special needs" patients may be wheelchair bound or otherwise non-ambulatory and require health care. Other "special needs" seniors may have chronic physical or mental conditions (e.g., history of stroke or heart attack, loss of eyesight, severe depression). The primary alternative for oral health care of "special needs" seniors, those requiring complex procedures or general anesthesia is treatment in an inpatient hospital setting. Another alternative for oral health care for "special needs" cases is the mobile (portable) unit—often overcoming problems created only by geography or logistics (Hight, 2005). Most patients served by these mobile units have conditions or diseases that are stable or in the maintenance phase of treatment and are amenable to care. Residency in nursing homes and assisted-living facilities has been shown to be barriers to the elderly patient's oral condition of the elderly patient (Nunez et al., 2011).

The United States Department of Health and Human Services (USDHHS) in "Healthy People 2010" presented educational goals and objectives aimed at resolving the inequalities surrounding health care of seniors. A key strategy in alleviating the disparities between seniors

and other economically differing groups of patients in the USA is promoting interdisciplinary training in the education of health care professionals (Dolan et al., 2005). To decrease these disparities, curricular models were proposed to promote interdisciplinary studies in dental and medical post-doctoral training (Pyle & Stoller, 2003). In the United States, interdisciplinary education in post-graduate geriatric studies in medicine and dentistry has been operationalized only relatively recently.

The USDHHS tracks educational programs in geriatric studies that support the interplay of didactic and clinical training of post-doctoral dentists and physicians (Pyle & Stoller, 2003). The USDHHS has provided an impetus for an ongoing federal program to "cross-educate" post-doctoral interns and residents in both geriatric medicine and dentistry. In addition, core competencies in treating seniors should be identified and become part of the curricula of medical and dental schools. This flow of information into the doctoral curricula of the health professions schools will expand the scope of oral health treatment of seniors. These shifts in oral health care should produce a welcome change in the training of practitioners in meeting the future health care needs of the growing cohort of seniors.

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