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Menopause as a Measure of Population Health: An Overview[†]

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The health of aging women is a global concern (United Nations, 1995; World Health Organization, 1996). No longer perceived to be the responsibility of more developed countries, the delivery of preventative health care to women at menopause and beyond presents a growing challenge to less developed countries more accustomed to battling infant and maternal mortality than osteoporosis and related conditions of aging (Diszfalusy, 1986). In many nations, the cohort of women now reaching menopause has enjoyed “the lowest mortality rates in human history” (Miles and Brody, 1994:5), resulting in an increase in absolute numbers of older women. By the year 2025, there will be a projected 825 million people 65 years and older, the majority of whom (572 million) will reside in less developed nations (United Nations, 1993), and of them the majority (454 million) will be women (United Nations, 1999). A surprising consequence of these demographic changes is that older women in many less developed countries, particularly in Latin America and Asia, will potentially spend more of their lives in the postmenopausal stage due to an earlier mean age at menopause (Wood, 1994) coupled with an increased life expectancy (United Nations, 1995; United States Bureau of the Census, 1992) compared to women in more developed countries.

The papers in this thematic collection focus on menopause and post-reproductive health of women. They share a biocultural framework, including the co-evolution of anatomic and behavioral changes in hominid evolution, which result in a uniquely long postmenopausal stage of life (Peccei); the potential influence of the social custom of marriage on age at menopause through pheromonal effects (Leidy Sievert et al.); and the impact of biomedical treatment on a study of symptom frequencies (Brown et al.). Other contributions (Lock and Kaufert; Beyene and Martin; Johnston; and Hewner) each explore distinct examples of “local biologies” to better understand the experience of menopause in their respective cultural settings. As these studies demonstrate, biological and sociocultural variables are both

cause and effect (Wiley, 1992), intertwined in “a continuous feedback relationship of ongoing exchange” (Lock, 1998:410).

In addition to demonstrating the applicability of the biocultural approach, these papers provide an opportunity to explore another unifying idea: that age and symptom experience at menopause may serve as measures of population health, just as age at menarche (Eveleth and Tanner, 1990), child growth status (Schell, 1986), and infant mortality rates (Swedlund, 1990) have been used as indicators of community well-being. Secular trends and comparisons of median ages at menarche have been used as indices of population health associated with industrialization and urbanization (Eveleth and Tanner, 1990; Pasquet et al., 1999), distribution of social resources (Veronesi and Guerresi, 1994), the effects of pesticide use (Graham et al., 1999), and the social disruption of war (van Noord and Kaaks, 1991; Prebeg and Bralic, 2000). As more attention is given to the health concerns of older women (United Nations, 1995; World Health Organization, 1996) and as more information is collected about diversity and change in median ages at menopause, age at menopause may be similarly used as a measure of population health.

AGE AT MENOPAUSE

As reviewed by O'Connor et al. (2001), the mechanism responsible for menopause is the continuous loss of ovarian follicles to the point at which menstrual cycles are increasingly variable in length and finally cease. Menopause is generally defined as the last menstrual period followed by 12 months of amenorrhea (World Health Organization,

[†]The articles for this special section on menopause arrived at various times and were acceptable, however, the entire collection was held until all articles were received. This accounts for the delay in publication.

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1981; Kaufert et al., 1987). Median ages at menopause vary between 49 and 52 years in developed countries such as the United States (MacMahon and Worcester, 1966; Stanford et al., 1987; Whelan et al., 1990; McKinlay et al., 1992), Italy (Parazzini et al., 1992), Spain (Rebato, 1988; Prado and Canto, 1999), and Finland (Luoto et al., 1994). Mean ages at menopause are earlier, between 41 and 47 years, in less developed countries, for example, Mexico (Beyene and Martin, 2001; Garrido-Latorre et al., 1996), New Guinea (Wood et al., 1985), India (Sarin et al., 1985; Randhawa et al., 1987), Pakistan (Wasti et al., 1993), Bangladesh (Karim et al., 1985), the Philippines (Goodman et al., 1985), and Cuba (Moreno et al., 1991). In Yucatan, Mexico, mean ages at menopause apparently vary along a rural to urban continuum from 42 years to 44 years (Canto-de-Cetina et al., 1988; Beyene, 1989; Dickinson et al., 1992).

The negative correlation between age at menarche and age at menopause in a nutritionally stressed Blackfeet population (Johnston, 2001) and a negative correlation between age at menopause and the probability of death in a White, Seventh-Day Adventist population (Snowdon et al., 1989) suggest that age at menopause may be a measure of population health similar to age at menarche and life expectancy. One important difference between age at menopause and age at menarche is the simple observation that there is more time between birth and menopause than between birth and menarche. In other words, if early nutrition and activity patterns affect both age at menarche and age at menopause (Frisch, 1978; Ellison, 1996, 1999; Johnston, 2001), then changes in childhood nutrition will be measurable after about 10–15 years in the age at menarche but after 35–55 years in the age at menopause. The absence of a secular trend in age at menopause (Malina, 1979; Flint, 1997; Johnston, 2001; Peccei, 2001) could be explained by the length of the time interval between changes in sociocultural conditions at childhood and physiological manifestations at adulthood. Menopause is yet to be evaluated among better-off cohorts of women in countries where improvements in the overall standard of living have been quite recent. When comparable methods across consecutive age cohorts demonstrate an upward secular trend in age at menopause, this will serve as

an indicator of improved health not only of individual women, but of entire populations.

The use of menopause as a measure of population health may seem paradoxical since menopause is associated with chronic disease. Menopause is associated with an increased rate of bone loss, but it is not necessarily the most important risk factor for osteoporotic fractures (Beyene and Martin, 2001; Hewner, 2001; Peccei, 2001). Also, earlier ages at menarche are associated with an increased risk of breast cancer (Kvale and Heuch, 1988; Kelsey et al., 1993), but earlier mean ages at menarche are also a marker of overall improvement in a population's standard of living. Late ages at menopause, also associated with an increased risk of breast cancer, can likewise serve as a measure of population health.

A final complicating factor in the use of menopause as a measure of population health is the effect of medical intervention. Brown et al. (2001) observed that 66% of a sample of postmenopausal school teachers in Hawaii had undergone menopause by hysterectomy. Johnston (2001) estimated a rate of surgical menopause of 43% among Blackfeet women of ages 50–69 years. Because hysterectomies are not random but are related to a woman's level of education and other social characteristics, studies that exclude women with hysterectomies may misrepresent the timing of menopause (Leidy, 1999). Further, many postmenopausal women take hormone replacement therapy (Brown et al., 2001); hence, the frequency of hot flash experience prior to interview is correspondingly low.

SYMPTOM EXPERIENCE AT MENOPAUSE

The perimenopause is characterized by increasingly variable hormone levels (O'Connor et al., 2001), and hot flashes are associated with some of these changes (Freedman, 2001). The hormonal changes appear to be universal (Beyene and Martin, 2001); however, the frequency of hot flashes across populations is not (Kronenberg, 1990; Avis et al., 1993; Lock, 1993, 1998; Lock and Kaufert, 2001). Further, simple conclusions cannot be drawn about differences in symptom reporting between developed and developing countries (Obermeyer, 2000). In Turkey, "muscle–joint–bone pain" was the symptom most often associated with menopause (Neslihan Carda et al., 1998), whereas in Japan, shoulder stiffness,

ringing in the ears, and a heavy feeling in the head were commonly associated with the menopausal transition (Lock and Kaufert, 2001).

Musculoskeletal symptoms in women of menopausal age may be related to hormonal changes, or they may be due to women's roles within particular cultures. Interestingly, women's roles are central to both evolutionary and contemporary investigations into menopause. For example, Peccei (2001) considers the role of grandmothers across hominid evolution in providing food, care, safety, and shelter for altricial young; in fulfilling supervisory roles; and in serving as reservoirs of knowledge. Peccei ultimately dismisses the centrality of grandmothers in the evolution of menopause, in part because grandmother hypotheses ignore other forms of social support.

In contemporary investigations of the health and roles of aging women, Beyene and Martin (2001) note that Mayan women are habitually physically active. It was estimated that Mayan women pull at least 114 kg of water weight every day and, during the farming season, walk a least two hours every day to farm plots. Physical fitness reflected in flexibility and muscular strength may compensate for a relatively low bone mineral density to prevent age-related fractures. Lock and Kaufert (2001) also emphasize the pervasiveness of exercise and weight-bearing activities among Japanese women, along with a low frequency of symptoms associated with menopause.

Hewner (2001) situates older women in the context of their household and community to understand postmenopausal aging as an influence on well-being. The relative importance of function, life style, prosperity, and social environment in models of household health show that the functional ability of elders is not necessarily a significant predictor of household well-being. But, the sociocultural context of aging is the critical factor in health, so much so that an Ifugao woman in the Philippines bent horizontal by osteoporosis can still contribute to the well-being of the larger community. Thus, the lack of correlation between illness and function may argue against the use of symptoms associated with menopause as a measure of population health, but emphasizes the importance of cultural context.

There is variation in the type and frequency of symptoms associated with meno-

pause (Beyene and Martin, 2001; Lock and Kaufert, 2001). Similarly, the correlates of menopausal symptoms are variable. Symptoms of menopause have been associated with smoking habits (Dennerstein et al., 1993), socioeconomic status (Wilbur et al., 1998), education level (Avis et al., 1997), parity (Beyene, 1989), prolonged lactation (Lancaster and King, 1992), history of premenstrual symptoms (Leidy, 1996; Skarsgard et al., 1996), phytoestrogens in the diet (Aldercreutz et al., 1992; Knight et al., 1996), the medicalization of menopause (Obermeyer, 2000), stressful life events (Hunter, 1993), and attitudes toward menstruation, menopause, and aging (Avis and McKinlay, 1991; Lock, 1993). Such variability may argue against the use of the symptoms of menopause as a measure of population health, particularly for comparisons of health across populations, but also indicates the need for comprehensive, biocultural approaches to the study of menopause.

CONCLUSION

The preceding discussion supports the use of age at menopause as an indicator of population health over broad sweeps of time. Age at menopause would be a conservative measure of well-being, perhaps less sensitive to change than age at menarche. However, if the same methods (e.g., probit and logit analysis) are consistently applied, then long-term patterns of change in age at menopause may be more apparent across age cohorts and across populations.

On the other hand, symptom experience at menopause is quite variable, and the etiology of the symptoms is multifactorial, which may limit the use of menopause as an indicator of population health. The roles, attitudes, and health-related behaviors of women shape culturally specific symptom experiences. Changes in symptom frequencies across age cohorts may be the result of increasing medicalization (Lock and Kaufert, 2001), or related to changes in diet or activity patterns. Unlike age at menopause, symptoms associated with menopause are immediately sensitive to health-related behaviors, such as smoking or coffee intake, changes in weight-bearing activity, or medical interpretation. Cross-cultural comparisons of symptoms at menopause are valuable for understanding many aspects of women's health (Avis et al., 1993; Lock, 1993, 1998), but symptom frequency cannot

be used as a general measure of population health. Nevertheless, the papers that comprise this thematic collection demonstrate the broad applicability of the biocultural perspective and the need for further study of menopause as a measure of population health.

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LITERATURE CITED

- Adlercreutz H, Hamalainen E, Gorbach G, Goldin B. 1992. Dietary phytoestrogens and the menopause in Japan. *Lancet* 339:1233.
- Avis NE, Crawford SL, McKinlay SM. 1997. Psychosocial, behavioral, and health factors related to menopause symptomatology. *Women's Health* 3:103-120.
- Avis NE, Kaufert PA, Lock M, McKinlay SM, Vass K. 1993. The evolution of menopausal symptoms. *Bailliere's Clin Endocrinol Metabol* 7:17-32.
- Avis NE, McKinlay SM. 1991. A longitudinal analysis of women's attitudes towards the menopause: results from the Massachusetts Women's Health Study. *Maturitas* 13:65-79.
- Beyene Y. 1989. From menarche to menopause: reproductive lives of peasant women in two cultures. Albany: State University of New York Press.
- Beyene Y, Martin MC. 2001. Menopausal experiences and bone density of Mayan women in Yucatan, Mexico. *Am J Hum Biol* 13:505-511.
- Brown DE, Leidy Sievert L, Aki SL, Mills PS, Etrata MB, Paopao RNK, James GD. 2001. The effects of age, ethnicity and menopause on ambulatory blood pressure: Japanese-American and Caucasian school teachers in Hawaii. *Am J Hum Biol* 13:486-493.
- Canto-de-Cetina TE, Canto-Cetina P, Polanco-Reyes, L. 1998. Encuesta de sintomas del climaterio en areas semirurales de Yucatan. *Rev Invest Clin* 50:133-135.
- Dennerstein L, Smith AMA, Morse C, Burger H, Green A, Hopper J, Ryan M. 1993. Menopausal symptoms in Australian women. *Med J Austral* 159:232-236.
- Dickinson F, Castillo T, Vales L, Uc L. 1992. Migration, socio-economic status and age at menarche and age at menopause in the Yucatan, Mexico. *Int J Anthropol* 10:21-28.
- Diczfalusy, E. 1986. Menopause, developing countries and the 21st century. *Acta Obstet Gynecol Scand Suppl* 134:45-57.
- Ellison PT. 1996. Developmental influences on adult ovarian function. *Am J Hum Biol* 8:725-734.
- Ellison PT. 1999. Reproductive ecology and reproductive cancers. In Panter-Brick C, Worthman CM, editors. *Hormones, health, and behavior*. Cambridge, UK: Cambridge University Press. p 184-209.
- Eveleth PB, Tanner JM. 1990. *Worldwide variation in human growth*, 2nd edition. Cambridge, UK: Cambridge University Press.
- Flint MP. 1997. Secular trends in menopause age. *J Psychosom Obstet Gynecol* 18:65-72.
- Freedman RR. 2001. Physiology of hot flashes. *Am J Hum Biol* 13:453-464.
- Frisch RE. 1978. Population, food intake, and fertility. *Science* 199:22-29.
- Garrido-Latorre F, Lazcano-Ponce EC, Lopez-Carrillo L, Hernandez-Avila M. 1996. Age of natural menopause among women in Mexico city. *Int J Gynecol Obstet* 53:159-166.
- Goodman M, Estioko-Griffin A, Griffin P, Grove J. 1985. Menarche, pregnancy, birth spacing and menopause among the Agta women foragers of Cagayan Province, Luzon, the Philippines. *Ann Hum Biol* 12:169-177.
- Graham MJ, Larsen U, Xu X. 1999. Secular trend in age at menarche in China: a case study of two rural counties in Anhui province. *J Biosoc Sci* 31:257-267.
- Hewner SJ. 2001. Postmenopausal function in context: biocultural observations on Amish, neighboring non-Amish, and Ifugao household health. *Am J Hum Biol* 13:521-530.
- Hunter MS. 1993. Predictors of menopausal symptoms: psychosocial aspects. *Bailliere's Clin Endocrinol Metabol* 7:33-45.
- Johnston SL. 2001. Associations with age at natural menopause in Blackfeet women. *Am J Hum Biol* 13:512-520.
- Karim A, Alauddin Chowdhury AKM, Kabir M. 1985. Nutritional status and age at secondary sterility in rural Bangladesh. *J Biosoc Sci* 17:497-502.
- Kaufert P, Gilbert P, Tate R. 1987. Defining menopausal status: the impact of longitudinal data. *Maturitas* 9:217-226.
- Kelsey JL, Gammon MD, John EM. 1993. Reproductive factors and breast cancer. *Epidemiol Rev* 15:36-47.
- Knight DC, Lyons Wall P, Eden JA. 1996. A review of phytoestrogens and their effects in relation to menopausal symptoms. *Aust J Nutri Diet* 53:5-11.
- Kronenberg FL. 1990. Hot flashes: epidemiology and physiology. *Ann NY Acad Sci* 592:52-86.
- Kvale G, Heuch I. 1988. Menstrual factors and breast cancer risk. *Cancer* 62:1625-1631.
- Lancaster JB, King BJ. 1992. An evolutionary perspective on menopause. In: Kerns V, Brown JK, editors. *In her prime: new views of middle-aged women*. New York: Bergin and Garvey. p 7-15.
- Leidy L. 1996. Symptoms of menopause in relation to the timing of reproductive events and past menstrual experience. *Am J Hum Biol* 8:761-769.
- Leidy L. 1999. The effect of exclusion: rates of hysterectomy and comparisons of age at natural menopause. *Am J Hum Biol* 11:687-693.
- Lock M. 1998. Menopause: lessons from anthropology. *Psychosomatic Med* 60:410-419.
- Lock M. 1993. *Encounters with aging: mythologies of menopause in Japan and North America*. Berkeley: University of California Press.
- Lock M, Kaufert P. 2001. Menopause, local biologies, and cultures of aging. *Am J Hum Biol* 13:494-504.
- Luoto R, Kaprio J, Uutela A. 1994. Age at natural menopause and sociodemographic status in Finland. *Am J Epidemiol* 139:64-76.
- MacMahon B, Worcester J. 1966. Age at menopause: United States 1960-1962. *Vital and Health Statistics, Series 11, No. 19*. Washington, DC: Department of Health, Education and Welfare.
- Malina RM. 1979. Secular changes in size and maturity: causes and effects. *Mon Soc Res Child Dev* 44 (serial no. 179, nos. 3-4):59-120.
- McKinlay SM, Brambilla DJ, Posner JG. 1992. The normal menopause transition. *Am J Hum Biol* 4:37-46.

- Miles TP, Brody JA. 1994. Aging as a worldwide phenomenon. In: Crews DE, Garruto RM, editors. *Biological anthropology and aging: perspectives on human variation over the life span*. New York: Oxford University Press. p 3–15.
- Moreno MC, Prado Martinez C, Martinez Fuentes AJ. 1991. *Patrones reproductivos de la mujer Cubana. Nuevas Perspect Anthropol* 141–145.
- Neslihan Carda S, Atike Bilge S, Nilgun Ozturk T, Oya G, Ece O, Hamiyet B. 1998. The menopausal age, related factors and climacteric symptoms in Turkish women. *Maturitas* 30:37–40.
- Obermeyer CM. 2000. Menopause across cultures: a review of the evidence. *Menopause* 7:184–192.
- O'Connor KA, Holman DJ, Wood JW. 2001. Menstrual cycle variability and the perimenopause. *Am J Hum Biol* 13:465–478.
- Parazzini F, Negri E, La Vecchia C. 1992. Reproductive and general lifestyle determinants of age at menopause. *Maturitas* 15:141–149.
- Pasquet P, Manguelle-Dicoum Biyong A, Rikong-Adie H, Befidi-Mengue R, Garba M-T, Froment A. 1999. Age at menarche and urbanization in Cameroon: current status and secular trends. *Ann Hum Biol* 26:89–97.
- Peccei JS. 2001. A critique of the grandmother hypothesis: old and new. *Am J Hum Biol* 13:434–452.
- Prado Martinez C, Canto Ferreira M. 1999. Climaterio en la mujer urbana: aproximacion bioantropologica y social sobre su morbilidad. *Anthropol Fis Latinoam* 2:83–106.
- Prebeg Z, Bralic I. 2000. Changes in menarcheal age in girls exposed to war conditions. *Am J Hum Biol* 12:503–508.
- Randhawa I, Premi HK, Gupta T. 1987. The age at menopause in women of Himachal Pradesh and the factors affecting the menopause. *Indian J Publ Health* 31:40–44.
- Rebato, E. 1988. Ages at menarche and menopause in Basque women. *Coll Antropol* 12:147–149.
- Sarin AR, Singla P, Sudershan KG. 1985. A 5-year clinico-pathological study of 2000 postmenopausal women from northern India. *Asia-Oceania J Obstet Gynaecol* 11:539–544.
- Schell, LM. 1986. Community health assessment through physical anthropology: auxological epidemiology. *Hum Organiz* 45:321–327.
- Skarsgard C, Bjors E, Nedstrand E, Wyon Y, Hammar M. 1996. Do women's premenstrual symptoms and their mother's climacteric history predispose to their own vasomotor symptoms. *Menopause* 3:133–139.
- Sievert LL, Waddle D, Canali K. 2001. Marital status and age at natural menopause: considering pheromonal influence. *Am J Hum Biol* 13:479–485.
- Snowdon DA, Kane RL, Beeson WL, Burke GL, Sprafka JM, Potter J, Iso H, Jacobs DR, Phillips RL. 1989. Is early natural menopause a biologic marker of health and aging. *Am J Pub Health* 79:709–714.
- Stanford JL, Hartge P, Brinton LA, Hoover RN, Brookmeyer R. 1987. Factors influencing the age at natural menopause. *J Chron Dis* 40:995–1002.
- Swedlund AC. 1990. Infant mortality in Massachusetts and the United States in the nineteenth century. In: Swedlund AC, Armelagos GJ, editors. *Disease in populations in transition: anthropological and epidemiological perspectives*. New York: Bergin and Garvey. p 161–182.
- United Nations. 1993. *World population prospects, 1992*. New York: United Nations.
- United Nations. 1995. *The world's women, 1995: Trends and statistics. Social Statistics and Indicators, Series K, No. 12*. New York: United Nations.
- United Nations. 1999. *World population prospects, the 1998 revision, Vol. II*. New York: United Nations.
- United States Bureau of the Census. 1992. *An aging world. II. International population reports, P25,92-3*. Washington, DC: U.S. Government Printing Office.
- van Noord PAH, Kaaks R. 1991. The effect of wartime conditions and the 1944–45 'Dutch Famine' on recalled menarcheal age in participants of the DOM breast cancer screening project. *Ann Hum Biol* 18:57–70.
- Veronesi FM, Guerresi P. 1994. Trend in menarcheal age and socioeconomic influence in Bologna (Northern Italy). *Ann Hum Biol* 21:187–196.
- Wasti S, Robinson SC, Akhtar Y, Khan S, Badaruddin N. 1993. Characteristics of menopause in three socioeconomic urban groups in Karachi, Pakistan. *Maturitas* 16:61–69.
- Whelan E, Sandler D, McConaughy D, Weinberg C. 1990. Menstrual and reproductive characteristics and age at natural menopause. *Am J Epidemiol* 131:625–632.
- Wilbur J, Miller AM, Montgomery A, Chandler P. 1998. Sociodemographic characteristics, biological factors, and symptom reporting in midlife women. *Menopause* 5:43–51.
- Wiley A. 1992. Adaptation and the biocultural paradigm in medical anthropology: a critical review. *Med Anthropol Q* 6:216–236.
- World Health Organization (WHO). 1981. *Research on the menopause. WHO Technical Report Series, No. 670*. Geneva: World Health Organization.
- World Health Organization (WHO). 1996. *Research on the menopause in the 1990s. WHO Technical Report Series, No. 866*. Geneva: World Health Organization.
- Wood JW. 1994. *Dynamics of human reproduction: biology, biometry, demography*. New York: Aldine De Gruyter.
- Wood JW, Johnson PL, Campbell KL. 1985. Demographic and endocrinological aspects of low natural fertility in highland New Guinea. *J Biosoc Sci* 17:57–79.