

Part 1:

# **BACKGROUND ON ADOLESCENT HEALTH**

## Chapter 2

# WHAT IS ADOLESCENT HEALTH?

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## Introduction

Although analyses by OTA and others certainly suggest a need for attention to the health of U.S. adolescents, it is important to note that what is *meant* by adolescent health is still not all that clear (37,56). Considerations of the meaning of adolescence and the way the health of adolescents is conceptualized are important, because such conceptions have significant consequences for:

- judgments about how healthy adolescents are;
- judgments about which adolescent health problems are most important;
- judgments about what health-related policies are justified; and
- decisions about the development of measures of health and health services utilization that are in turn used to help judge the need for changes in services and policies.

Conceptualizations of health are important in considering the health of any segment of the population, but because of the unusual social status of adolescents (55), unique issues are raised. This chapter provides a brief overview of some of the basic changes that occur during adolescence and their implications for adolescent health policy. It then discusses issues in defining health and adolescent health in particular. As discussed below, the focus of the chapter, and of this Report, is on adolescents ages 10 through 18 years.

## What Is Adolescence?

For some adults, the period of adolescence is one they would rather forget (they “learned the truth at 17” ‘). For others, it is a period they continue to recall with happy memories (the ‘Glory Days’ ‘). Probably most adults view adolescence, like other periods of development, as a period of both positive and

negative experiences and emotions. But there is something about the intensity of adolescence that marks it as subjectively different from other periods. At the same time, no two adolescent experiences are alike, and “capturing the adolescent experience” (18) in research, and on paper, is a difficult task. This section on adolescent development reviews evidence for the notion that adolescence is “a social construct, one that is changing even as we examine it” (55). It then describes the basic biological and cognitive foundations of change during adolescence. The section relies heavily on chapters by Modell and Goodman (55), Keating (43), and Brooks-Gunn and Reiter (11) in the recent volume, *At the Threshold: The Developing Adolescent* (24), which should be consulted for more comprehensive analyses, and on a summary of these chapters and others by Zaslow (89).

## Historical Perspectives on Adolescence

As Zaslow notes, “our understanding of adolescence is enhanced by placing it in a historical context” (89). Basic *physical* changes do mark the transition from childhood to maturity (see below), but the long period that we now refer to as adolescence has largely been constructed in response to economic and social changes in the last 2 centuries (55). According to Modell and Goodman, in terms of the current social status of adolescents, “The most critical component in this evolution was the spread of schooling. . . .” (55).<sup>1</sup>

According to Modell and Goodman, the contemporary *idea* of adolescence in Western Europe and the U.S. emerged from particular economic and social circumstances associated with industrialization (55,89). Just prior to the industrial revolution, there was a special status for young people that

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<sup>1</sup>Modell and Goodman provide an interesting comparison of changes in the status of adolescents and the relative importance of schooling v. labor in Great Britain and the United States (55). This portion of Modell and Goodman’s analysis suggests that it is not only economic forces, but the predominant ideology of a nation, that determines a nation’s social structure (55). A comprehensive analysis of the forces that determine a nation’s social structure is beyond the scope of this Report. As summarized by Modell and Goodman, the British tended to be more concerned with inculcating and maintaining “internalized codes of behavior appropriate to one’s station in life,” while the Americans were interested in “conveying to its citizens the sense of a capacity to master whatever situation might arise” (55). Thus, “when American school authorities urged children to stay in school, they reflected the ideological structures that held that extended schooling meant opportunity” (55). In contrast, the British system made decisions early on about educational and thus employment opportunities for young people. For example, until 1921, Britons as young as ages 12 and 13 could attend school for only half a day and leave school by age 14 (55). The American experience was also marked by a great influx of unskilled immigrants at around the turn of the century, with fewer requirements for the labor of children (55).

“gave modest recognition to [youth] as [a period] of preparation for adulthood” (55). But in this period, “youth roles were almost continuous with adult roles” (55).<sup>2</sup>In the agrarian societies that predominated, the family was the primary economic and social unit and thus the dominant force in an individual’s life.<sup>3</sup>Occupational choices were limited and fairly well-defined.

With the coming of the industrial revolution and the urbanization of industrialized nations, the progression from childhood to adulthood became more difficult:

It was no longer entirely clear what steps one had to take to become an adult. The shrinking of opportunities for farming led families to encourage sons to seek other professions requiring formal training. The tradition of apprenticeship declined. Adolescents became economically dependent on the family. Adult roles were no longer inherited and prescribed, but now involved choice and initiative (89).

Whereas before young people were integral to the economic survival of their families and thus to society, they came increasingly to be seen as “marginal” (55). For a while, young people—especially those in cities—were viewed as “brash and troublesome. This perception shifted to a view of young people as “vulnerable and in need of help,” and “various extrafamilial institutions came into being to help socialize individuals into the new corporate and bureaucratic world” (55,72). Chief among these extrafamilial institutions was the public high school, which was becoming an upward route

into the American middle class (55).<sup>4</sup>Other institutions (e.g., Boy Scouts, settlement houses<sup>5</sup>) also became part of the child development movement.<sup>6</sup>

As summarized by Modell and Goodman:

With the industrialization and urbanization of the nineteenth century, the orderly progression of young people toward adulthood became so widely problematic that concerned middle-class adults elaborated a specialized vocabulary and set up special institutions for adolescents (55).

According to Modell and Goodman, “no single individual did more to popularize and solidify adolescence as a critical developmental phase than G. Stanley Hall,” the psychologist and author of the 1904 volume *Adolescence: Its Psychology, and Its Relations to Anthropology, Sex, Crime, Religion, and Education* (28,55). According to Modell and Goodman, Hall’s volume “contributed to the cooperation in America between academic psychology, the rapidly spreading public school bureaucracy, and the lesser groupings of professionals outside the schools committed to the task of aiding child development” (55).

Hall and his followers’ conception of adolescence was as a period in which a person is virtually reborn; it was “a phase of upheaval and trauma, storm and stress, corresponding to mankind’s evolutionary progress from savagery to civilization” (55).<sup>7,8</sup> These conceptions of adolescence also became “a powerful justification for the institutional specialization and even segregation of youth, so they might

<sup>2</sup>The term youth was used, but it was not age-specific, and it overlapped considerably with use of the term childhood (55). “Youth” referred to “an extended stage defined by the economic status and role of the individual who was not fully dependent on his or her parents for economic support, who contributed to the financial stability of the family, but who was nonetheless not in a position to assume an independent adult role and set up his or her own household” (55). Individuals as young as age 12 or as old as age 24 could be referred to as youths, but the term children encompassed individuals ages 18 or 21 and younger (55).

<sup>3</sup>Modell and Goodman note the tradition of “fostering out” that seems contrary to the dominance of the family of origin (55). Children who were “fostered out” worked in other households while they were aged 12 to 15. This tradition provided “further training in economic roles, [and] a transitional period toward independence but within a family setting” (89).

<sup>4</sup>Eventually, the “total high school experience [became] romanticized as an episode of irreplaceable social and personal discovery. The high school popularized a new image of youth. . . as a creative and progressive life stage” (74). The reality of the contemporary high school experience varies considerably, of course. Evidence for the impact of middle and high school environments on adolescent health is reviewed in ch. 4, “Schools and Discretionary Time,” in this volume.

<sup>5</sup>Settlement houses were institutions providing various community services, especially to large city populations.

<sup>6</sup>At about the same time, there was concern about the fate of children on a national level. The establishment of a Children’s Bureau in the U.S. executive branch is described in ch. 19, “The Role of Federal Agencies in Adolescent Health,” in Vol. III.

<sup>7</sup>To Hall and his followers, each stage of life corresponded to the developmental process of the human race as a whole (55).

<sup>8</sup>As discussed elsewhere in this Report, this formerly popular notion has been discredited (24). Such notions led to the view that poor health, in particular, poor mental health, odd behavior, and subjective distress, were to be expected during adolescence.

more productively act out phase-specific turmoil understood as characteristic of their age' (55).

It is usually more difficult to characterize contemporary times than to reflect on historical changes.<sup>9</sup> As noted above, there are many adolescent experiences, in the past (55) and in modern times (12a). It seems fair to say that many of the changes in conceptualizations and social structure of adolescence that occurred following the industrial revolution (e.g., 28) persist today. As summarized by Modell and Goodman:

At the beginning of the twentieth century, most youth were in the work force, not in school.<sup>10</sup> Good behavior was positively sanctioned not by promises of future utility and reward but by immediate payment and preferment. Bad behavior was sanctioned negatively not by physical or social humiliation but by the threat of dismissal. At the same time, marriage was typically far in the future,<sup>11</sup> and a youth's commitment was solidly to the family of origin.

There were many points of tension in the turn-of-century transition pattern. . . The modal adolescent increasingly found herself or himself at school, and his or her perceived needs and deficiencies changed accordingly. School, unlike the work force, is an age-segregated institution which, by its nature,

focuses on socializing young people for adult roles. . . In th[e school] setting, adolescence has evolved as a transitional period of preparation for adulthood (55).

In late-20th century United States, there is some ambiguity about social expectations during adolescence (box 2-A), although there continues to be considerable age-segregation of youth. Staying in school until high school graduation (typically age 18<sup>12</sup>) or, increasingly, beyond (i.e., college or graduate school) is the preferred norm<sup>13</sup> (87). There is increasing concern that adherence to this norm results in the neglect of the millions of young people who do not go on to college—the so-called “forgotten half”<sup>14</sup> (87), as well as to a prolonged sense of rolelessness among young people who remain in school (60a). The young people who do not go on to college and who obtain jobs<sup>15</sup> may be better able than young people still in school to perceive themselves as adults in some respects (i.e., they are more financially independent), but the reality is that the initial earning power and the long-term prospects for advancement of these young people have declined considerably in comparison with the earning power and prospects for advancement of young

<sup>9</sup>As Modell and Goodman, note, however, ‘social-historical accounts are rarely definitive’; thus, a chapter like theirs is necessarily interpretive (55).

<sup>10</sup>In 1900, U.S. males typically left school at age 16 and entered the work force at age 15.5; British males left school at age 13 and entered the work force at age 14 (55).

<sup>11</sup>The typical age of marriage for U.S. females in 1900 was 22.5 years; in 1960, it was about 20 years; and in 1980, about 24 years (55).

<sup>12</sup>Without attempting to come to a definitive definition of adolescence, OTA decided to focus this Report on 10- through 18-year-olds. Many individuals have begun puberty by age 10, and health issues of young adolescents have been relatively neglected. While the legal age of majority is 18 in most States (and thus many 18-year-olds are legally adults), many adolescents are still in high school at age 18 and thus are more or less dependent. High school completion continues to define the end of adolescence in many ways; age 18 is used as a surrogate marker for high school completion. As discussed in the W.T. Grant Commission report, the fact of high school graduation or legally becoming an adult creates a whole new set of contingencies and opportunities for addressing health issues (87). OTA felt that attempting to address these issues as well as those affecting younger adolescents would compromise its overall effort; however, this does not mean that the post-high-school period is not potentially fraught with health-related difficulties and does not deserve attention (58,87).

The Report tries to be as specific as possible in referring to adolescents of different developmental stages. However, much of the research refers to adolescents of unspecified ages. When ages are indicated, the adolescents involved in the research are more likely to be older than younger adolescents. As a general matter, 10- to 14-year-olds are considered early adolescents, 15- to 17-year-olds are considered middle adolescents, and 18- to 21-year-olds are considered late adolescents (e.g., 18). But, as discussed below, age is not an ironclad indicator of developmental status.

<sup>13</sup>In 1988, 80 percent of U.S. 25- to 29-year-olds, and approximately 70 percent of those 25 and older, had graduated from high school and had some college (76). Many individuals finish high school and go on to college, but do not complete 4 years of college. In 1988, 60 percent of U.S. 25- to 29-year-olds had completed at least 12 years of high school, but had less than 4 years of college; 20 percent had completed 4 or more years of college (76).

<sup>14</sup>The calculation that “half” are forgotten is based on the 20 million 16- to 24-year-olds in the U.S. population who have not graduated from high school or gone on to college and who are unlikely to go to college (87). Note that this calculation is somewhat different from calculations of the numbers who have been graduated from high school or gone to college by age 25 or older (76).

<sup>15</sup>In June 1991, unemployment rates for young U.S. workers ages 20 to 24 were 9.9 percent for whites and 22.7 percent for blacks (83). In June 1991, unemployment rates for adolescents ages 16 to 19 were 17.5 percent on average (19.9 percent for white males), and 33.7 percent for blacks (37.4 percent for black males) (83). Unemployment rates are calculated only for those who are looking for employment; they do not include adolescents attending school or keeping house, or adolescents who are discouraged workers, defined as persons who did not look for work because they believed that no jobs were available in the area or that no jobs were available for which they could qualify (83).

### Box 2-A—Examples of Differences in the Legal Status of U.S. Adolescents by Category of Activity

Although the age of majority is 18 in all States but three (Alaska Nebraska, and Wyoming, where it is 19), adolescents can legally assume adult-like rights and responsibilities at different ages. Depending on the privilege or obligation in question, and, sometimes, the State in which they live, adolescents:

- are able to work part time at 14, full time at age 16<sup>1</sup> (84);
- are able to leave school at 14, 16, 17, or 18, depending on the State<sup>2</sup> (76);
- can be licensed to drive at age 14<sup>3</sup> or 16 (2a);
- are able to buy cigarettes at age 17 (80);
- are able to sign contracts at age 18<sup>4</sup>;
- are able to consent to health care at age 18 or 19, except in five States<sup>5</sup> (27,75a);
- are able to vote at age 18 (Public Law 91-285);
- must enlist for draft at 18 (males) (Public Law 96-107); and
- are able to buy alcohol at age 21 (78).

<sup>1</sup>These are the basic minimums for nonagricultural industries set by the Fair Labor Standards Act of 1938 (Chapter 676 of the U.S. Code) (84). Different standards for agricultural industries, family farms, and hazardous occupations, as well as restrictions on hours worked, are summarized in the U.S. General Accounting Office report on child labor violations (84).

<sup>2</sup>As of 1988, only one State (Mississippi) permitted individuals to leave school at age 14 (76). Thirty-two States ended compulsory school attendance at age 16 (76).

<sup>3</sup>There are restrictions in the States that allow driving at age 14, but the restrictions vary (2a). In some of the States that allow driving at age 14, the driver merely must have completed an approved driver education course (e.g., in Idaho) or must have a guardian's or parent's consent to get the driver's license (e.g., Nevada). In other States, 14-year-old licensed drivers must be accompanied by an older licensed driver (e.g., aged 18 in Wyoming aged 21 in Arkansas).

<sup>4</sup>In three States (Alaska, Nebraska, and Wyoming), the age of majority is 19. See ch. 17, "Consent and Confidentiality in Adolescent Health Care Decisionmaking," in VOL III.

<sup>5</sup>Five States (Alabama, Kansas, Rhode Island, South Carolina, and Oregon) have enacted statutes that specifically authorize minors who have reached a designated age—ranging from 14 to 16—to consent to health care. In general, the body of law governing the allocation of authority for health care decisionmaking concerning adolescents is large and complicated and there are many exceptions to the common law rule that parental consent is generally required for the medical or surgical care of a child who has not reached the age of majority. See ch. 17, "Consent and Confidentiality in Adolescent Health Care Decisionmaking," in Vol. III (75a), and Gittler et al., "Adolescent Health Care Decision-Making: the Law and Public Policy" (27).

people who go on to college (87).<sup>16</sup> The impact of "rolelessness" on adolescent health is less well-documented, but anecdotal evidence suggests that it may be considerable.

In addition to the lengthening of adolescence, biological changes in the past 2 centuries, induced by the control of infection and better nutrition, have caused adolescence to begin earlier, at least in the biological sense (29,52). According to McAnarney, recent decreases in the average age of menarche have occurred at approximately 3 months per decade (52). Thus, at the turn of the century, the average age of menarche in the United States would have been about 14½ years of age, approximately 2 years older

than the current average of about 12½ years (29,70). As discussed below, maturation of the reproductive glands (e.g., the ovaries and testes) begins at about ages 9 to 10, before overt signs of reproductive maturity such as menstruation (68). Thus, individuals are becoming reproductively mature at earlier ages. Although she is in the minority with respect to the upper age bound for adolescence,<sup>17</sup> Baumrind suggests with good reason that contemporary adolescence can be said to span ages 10 through 25, with biological markers indicating the younger age boundary and social changes (end of postsecondary education, marriage) indicating the upper boundary (6).

<sup>16</sup>According to the W.T. Grant Commission's analysis of data from U.S. Census Bureau Current Population Surveys, between 1973 and 1986, real mean annual earnings of 20-to 24-year-old civilian males not enrolled in school declined 42 percent for those without a high school diploma, 28 percent for high school graduates, 16 percent for those with some college, and 6 percent for college graduates (87). Another comparison of census data on average earnings of slightly older groupings of males (males ages 25 to 34 and 35 to 44) from 1979 and 1986 found results that were similar, though not as striking (61).

<sup>17</sup>Other boundaries on adolescence include ages 10 to 20 (2); ages 10 to 18 (39); ages 10 to 18 and 10 to 19 (3,58); and ages 12 to 17 (46).



Photo credit: Calpitot Hill Arts Workshop, Washington, DC

**Adolescence is a period of profound biological, emotional, intellectual, and social transformation.**

In the contemporary United States, the core “developmental tasks” of adolescence can be said to be the following (18):

- becoming emotionally and behaviorally interdependent, rather than dependent;
- dealing with emerging sexuality;
- acquiring interpersonal skills and preparing for mate selection;
- acquiring education and other experiences needed for adult work roles; and
- resolving issues of identity and values.

Societal expectations may make appropriate completion of the developmental tasks difficult by at the same time: 1) expecting all adolescents to take one developmental pathway; 2) sending ambivalent messages about the completion of adolescence and the beginning of adulthood; and 3) lending relatively little support for coping with developmental changes.

A return to a more structured, family-dominated, agrarian life in the United States, and thus a more well-defined adolescence, is unlikely; in any event, it would be foolhardy to romanticize pre-20th century life for young people (55). But in considering public policy related to adolescents, it is important to recognize that, as a consequence of economic and social changes, the years of preparation for adulthood in *contemporary* times may be “fuller, tenser, and more overwhelming for the

young people moving through them” (55); they may also span a longer portion of an individual’s life. As noted by Modell and Goodman in the conclusion to their chapter, “these observations may be somewhat troubling to readers,” but the notion that adolescence is a social construct “should not deflect our attention. Rather, the malleability of adolescence points to the deep importance of understanding its attributes within a concrete context;. . . [y]oung people. . . need more guidance from caring and watchful adults” (55).<sup>19</sup>

Succeeding parts of this section provide a brief review of basic physiological and cognitive foundations of change that occur during adolescence. The recent book *At the Threshold: The Developing Adolescent* provides a more comprehensive review of the knowledge base on adolescent development (24). Understanding these changes is basic to understanding the experiences of contemporary adolescents.

### ***Basic Physiological Changes in Adolescence***

Physical development, in particular “the spectacular development of the reproductive system” (69) permeates every aspect of development during adolescence, especially early adolescence (11,24,69). The progression of physical development during adolescence has been well-described (see 11,69), but the physiological *mechanisms* responsible for initiating and regulating maturation and bodily growth, and the environmental factors that may interact with biological ones to enhance or impede maturation are still not fully understood (11,68).

### **Overt Physical Changes in Adolescence**

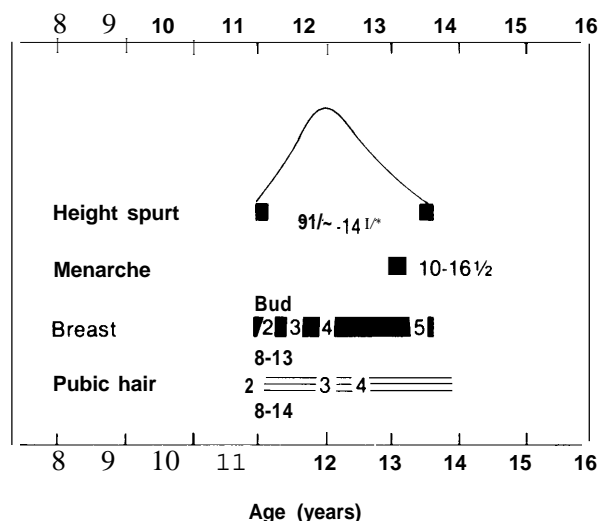
Figures 2-1 and 2-2 present several of the critical overt physical aspects of the developmental course of adolescence in relation to each other: the height spurt, the beginning of menstruation (menarche), breast development, and pubic hair development in adolescent females (figure 2-1); and the height spurt, penile and testicle development, and pubic hair development in males (figure 2-2). In females, the height spurt takes place between 9.5 and 14.5 years on average; menarche between 10.5 and 15.5 years on average; breast development in five stages

<sup>18</sup>*Developmental tasks* are skills, levels of achievement, and social adjustment considered important at certain ages for the successful adjustment of the individual, and for the individual to progress to the next “stage” of development (e.g., adulthood).

<sup>19</sup>The idea that it is important to understand the current social context for young people was also reflected in the W.T. Grant Commission report on youth ages 16 to 24 who do not go on to college: “The world around us has changed, but our institutions have not responded with the flexibility required to help lay a new foundation under young families and their children” (87).



**Figure 2-1-Sequence and Timing of Four Key Pubertal Events During Adolescence: Adolescent Females<sup>a</sup>**

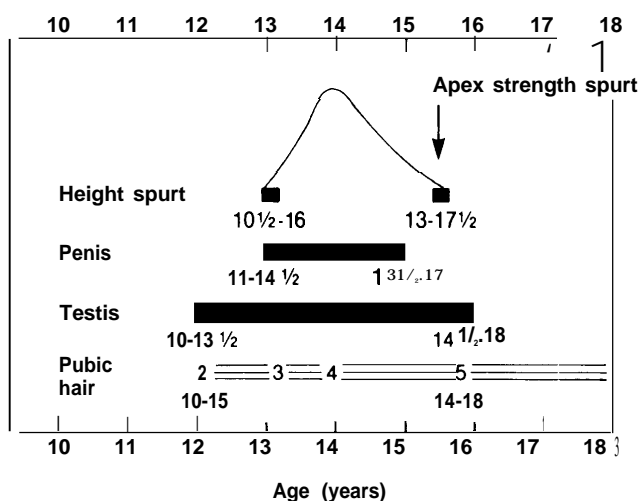


<sup>a</sup>Note that the figure indicates averages, ranges, and the normative sequence for four specific events. The horizontal lines and rating numbers marked pubic hair stand for its advent and development. The rating numbers for pubic hair indicate stages of pubertal development (69). The appearance of the breast bud is as a rule the first sign of puberty in the female, though the appearance of pubic hair may sometimes precede it. Stages of breast development are incorporated within the solid line to the right of the word breast. The range of times for appearance of the breast bud, the beginning of pubic hair, menarche, and peak velocity in height are shown directly under those events (69).

SOURCE: J.M. Tanner, *Growth at Adolescence*, 2d ed. (Oxford, England: Blackwell Scientific Publications, 1962). Reprinted with permission.

between ages 8 and 18; and pubic hair development in several stages between ages 11 and 14 (figure 2-1). In males, the acceleration of penis growth begins on average at about age 12.5, but sometimes as early as 10.5 and sometimes as late as 14.5 (70). According to Tanner, “the sequence of events, though not exactly the same for each boy, is much less variable than the age at which the events occur. The spurt in height and other body dimensions begins on average about a year after the first testicular enlargement [ages 10 to 13.5] and reaches its maximum. . . after about a further year. . .” (figure 2-2) (70). At various points, dramatic changes occur in other body systems (e.g., weight, facial structure and expression, brain structure) (see figure 2-3). The fact that these changes are not simulta-

**Figure 2-2-Sequence and Timing of Four Key Pubertal Events During Adolescence: Adolescent Males<sup>a</sup>**



<sup>a</sup>Note that the figure indicates averages and ranges for four specific events, as well as the average sequence of four pubertal events, as follows: The solid areas marked penis and testis represent a general picture of the period of accelerated growth of these organs, and the horizontal lines and rating numbers marked pubic hair stand for its advent and development, with the rating numbers for pubic hair indicating stages of pubertal development (69). Figures for the range of ages at which the spurts for height and for penis and testis growth begin and end are inserted underneath the first and last points of the curves or bars. The acceleration of penis growth, for example, begins on average at about age 13, but sometimes it occurs as early as 11, and sometimes as late as 14 1/2. The completion of penis development usually occurs about age 15, but sometimes at 13 1/2 and sometimes at 17. At ages 13 and 14, there is an enormous variability among any group of boys, who range practically all the way from complete maturity to absolute preadolescence. The sequence of events, though not exactly the same for every adolescent male, is much less variable than the time at which the events occur (69).

SOURCE: J.M. Tanner, *Growth at Adolescence*, 2d ed. (Oxford, England: Blackwell Scientific Publications, 1962). Reprinted with permission.

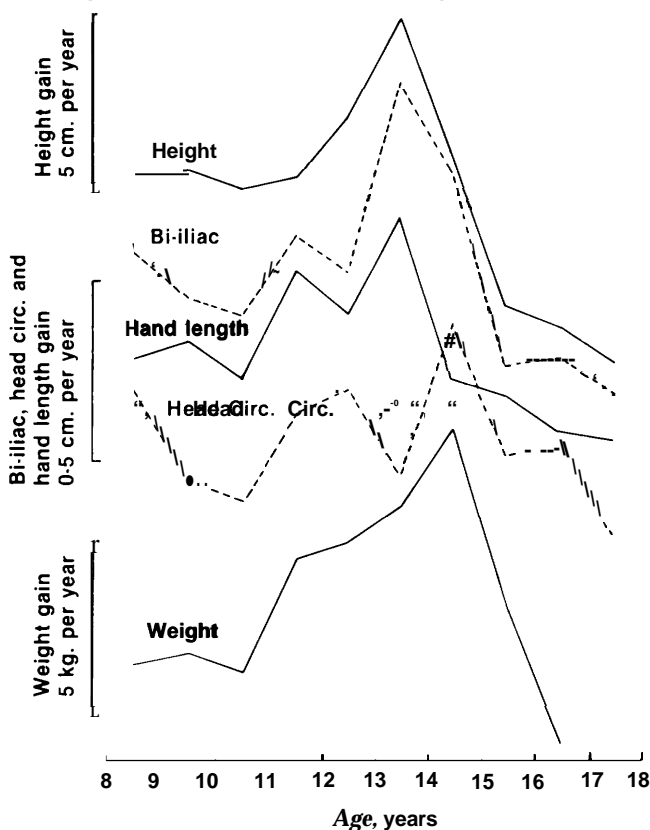
neous is important to understanding what individuals face during adolescence.

### Hormonal Changes in Adolescence<sup>20</sup>

In addition to confronting overt and discontinuous changes in themselves and others, with attendant concerns about being “normal,” adolescents must begin to deal with sexual arousal and other internal changes (11). Prior to and during adolescence, the following normative physiological and hormonal changes occur, as summarized by Susman and her colleagues:

<sup>20</sup>Hormones are chemical substances, formed in one organ or part of the body and carried in the blood to another organ or part of the body, that can alter the functional activity (and sometimes the structure) of another organ or organs.

Figure 2-3—Growth Spurts During Adolescence



SOURCE: Figure 5 on p. 13 in J.M. Tanner, *Growth at Adolescence*, 2d ed. (Oxford, England: Blackwell Scientific Publications, 1962) based on L. Reynolds and G. Schoen, "Growth Patterns of Identical Triplets From 8 to 18 Years," *American Journal of Physical Anthropology* 5:165-200, 1947. Copyright © 1947 by John Wiley & Sons. Reprinted by permission of Wiley-Liss, a Division of John Wiley & Sons.

Adrenarche, maturation of the adrenal glands,<sup>21</sup> begins at ages 6 to 8. Following adrenarche, there is a gradual rise in adrenal androgens<sup>22</sup> that continues up to the age of 18 to 20, when levels reach a plateau. Adrenarche is followed in rather rapid succession by gonadarche [maturation of the reproductive organs], which is accompanied by a rise in gonadotropins<sup>23</sup> and gonadal steroids that continue to rise up to age 15 or 16, when adult levels are reached (68).

The physiological changes during adolescence are profound and discontinuous with earlier periods

of development (68). According to Tanner, "Puberty is the time of the greatest sex differentiation since the early intrauterine months" (70). Thus, it is not surprising that a popular conception about adolescents is that they are controlled by raging hormones. Many commonly observed adolescent "attitude problems" such as talking back to teachers and parents, sullenness, moodiness, and irritability, as well as major emotional and behavioral disturbances, have been attributed to the hormonal changes that occur prior to and during adolescence (68). According to Susman and her colleagues, "the natural rise in hormone levels at puberty provides for an experiment in nature. . . adolescence is an ideal developmental period in which to trace the patterns of change in both hormones and behavior within a short period" (68). Unfortunately, research in this area has begun relatively recently (circa 1978), and the effects of the rise in many hormones on the behavior of adolescents generally are unknown (68). While there is some evidence that hormonal changes in adolescence influence some behaviors (see 68), there is also considerable evidence for the primary influence of prior expectations and social environment on adolescents' behavioral responses to pubertal processes (24).

As Susman and her colleagues note, "the connection between normal 'attitude' problems and hormone changes is of major concern to those individuals who are entrusted with the socialization of youth" (68). She and her colleagues suggest that additional resources and effort be put into studying the hormonal and other aspects of emotional development in normal adolescents. Important research questions include: What are the mechanisms whereby pubertal hormone changes affect brain development and behavior during adolescence? To what extent is adolescence continuous or discontinuous with other periods of development? What is the causal role of hormonal variations in adolescent mood fluctuations? As noted elsewhere in this Report, very few

<sup>21</sup>The adrenal glands are endocrine glands situated near the kidney that produce steroids like sex hormones (e.g., estrogen, testosterone, estradiol), hormones related to metabolic functions, and adrenaline.

<sup>22</sup>Androgens (or androgenic hormones) are male sex hormones such as testosterone, which is responsible for inducing and maintaining secondary male sex characteristics.

<sup>23</sup>Gonadotropins are hormones that act upon the gonads (e.g., follicle-stimulating hormone, which stimulates the growth of follicles containing Ova [eggs] and activates sperm-forming cells).

### Box 2-B—In Search of Self: Identity Development in Adolescence

**The** development of an integrated, positive, yet realistic identity has long been considered a hallmark of healthy emotional and social development; optimally, much of this development takes place during the adolescent years (23). Harter's recent review of the process of identity development during adolescence in *At the Threshold: The Developing Adolescent* (32) helps to encapsulate the subjective meaning for adolescents of some of the basic processes described in other chapters in that volume (1 1,43,55).

An adolescent's emerging ability to think abstractly makes it possible to imagine "ideal" selves, which can be compared to perceived actual selves. Yet the same cognitive changes that can facilitate the journey of self-development during adolescence make its navigation difficult. Like inconsistencies between the real world and the ideal world (24,43), substantial inconsistencies between one's actual and ideal selves can be a cause of extreme subjective distress (35), as is evident from the following synthesis of a self-portrait at mid-adolescence:

What am I like as a person? Complicated! I'm sensitive, friendly, outgoing, popular, and tolerant, though I can also be shy, self-conscious, and even obnoxious. Obnoxious! I'd **like to be** friendly and tolerant all of the time. That's the kind of person I **want** to be, and I'm disappointed when I'm not. . .

Sometimes I feel phony, especially around boys. Say I think some guy might be interested in asking me out. I try to act different, like Madonna. I'll be flirtatious and fun-loving. And then everybody, I mean everybody else is looking at me like they think I'm totally weird! Then I get self-conscious and embarrassed and become radically introverted, and I don't know who I really am! Am I just trying to impress them or what? But I don't really care what they think anyway. I don't **want** to cam, that is. I just want to know what my close friends think. I can be my true self with my close fiends. I can't be my real self with my parents. . .

At least at school people treat you more like you're an adult. That gets confusing, though. I mean, which am I, a kid or an adult? . . . (32).

As summarized by Harter:

This personal narrative exemplifies numerous prototypic features of self-description during middle adolescence. . . . We witness an introspective self-portrait that is couched in the language of traits of the self-obnoxious, tolerant, introverted, popular, cheerful, depressed-many of which appear to be contradictory. We glean that the display of different selves in different social contexts is cause for concern, as the adolescent struggles to reconcile these different selves as well as determine which is the 'real me.' Experimenting with one's persona. . . is typically an emotional experience for the adolescent preoccupied with the challenge of self-definition. . . (32).

Federal resources are dedicated to studying normal adolescent development.<sup>24</sup>

### Cognitive Changes During Adolescence

The evidence suggests that the early adolescent period is a key juncture in the development of human cognitive capabilities, in that, across the age range of 11 to 14, "what was previously a minority of successful reasoners becomes a majority" (43,89).<sup>25</sup> Thus, in contrast to younger children, adolescents:

- . show an increased ability to generate and hold in mind more than one complex mental representation;

- show an appreciation of the relativity and uncertainty of knowledge;
- tend to think in terms of abstract rather than only concrete representations;
- . show a far greater use of strategies for obtaining knowledge, such as active planning and evaluation of alternatives; and
- are self-aware in their thinking, being able to reflect on their own thought processes and evaluate the credibility of knowledge sources (43,89).

Although these changes clearly give adolescents an advantage over younger children in daily decisionmaking, the process of going through these changes may be difficult for some adolescents and

<sup>24</sup>See ch. 19, "The Federal Role in Adolescent Health," in Vol. III, which notes that under 7 percent of the budget of the National Institute for Child Health and Human Development (National Institutes of Health, Public Health Service, U.S. Department of Health and Human Services) is devoted to adolescent issues. Much of this is problem-oriented rather than focused on normal development.

<sup>25</sup>This is consistent with the evidence (sparse though it may be) on adolescents' reasoning during health care decisions (see ch. 17, "Consent and Confidentiality in Adolescent Health Care Decisionmaking," in Vol. III). Also see Mann, Harmoni, and Power (49) whose review found that transitional periods for shifts in decisionmaking tend to fall at about 11 to 12 years, and again at 15 to 16 years.

Harter notes further that these processes “do not occur within an introspective vacuum” (32). Peers, parents, and teachers are important sources of expectations, evaluations, values, directives, feedback and social comparison (32). Others have noted that adolescent experiences can vary considerably in different gender groups (26) and racial groups (66a,71).

An important contribution of work on the process of identity development by Harter and others is the finding that the dramatic changes in the conceptions of self that occur during adolescence do not occur overnight; important changes occur throughout the adolescent period (13,32). The most subjectively distressing shift appears to occur around ages 14 or 15, when individuals not only detect inconsistencies across what they perceive as their various selves (e.g., their behavior in relation to parents, friends, romantic partners), but “are also extremely troubled and conflicted over these contradictions, much more so than are the youngest (around ages 11 to 12) or oldest (around ages 17 to 18) groups” (13,31,32). For example, the youngest adolescents, who are apparently unconcerned about potential contradiction, make remarks such as “Well, you are nice to your friends and then mean to people who don’t treat you nicely; there’s no problem” (31,32). By about age 17 or 18, many adolescents have reached an accommodation with their different “selves” and can make such statements as: “Sometimes it’s fun to be rowdy, but at other times you just want to be in a quiet mood; you really need to do both with really good friends” (31,32).

Harter refers to these shifts as “normative” because they typically happen in a normal adolescent; however, certain deficiencies in an adolescent’s social and psychological environment may interfere with their occurrence. In addition, although these shifts are normal, some of them are accompanied by significant subjective distress while they occur. As Harter points out, it is a “myth” that these “normal” changes necessarily produce happy outcomes in the short run (e.g., 21). Further, adolescents may act out these possible selves (22,62), and this role experimentation can “usher in another potential source of tension among multiple selves” (32).

To summarize, the elements of self and identity development during normal adolescence include differentiation of the self into multiple domains (e.g., scholastic competence, athletic competence, physical appearance, social acceptance), the construction of actual and ideal selves, and the integration of multiple self-concepts into a unified self-theory (32). It is no wonder that adolescents often evidence a preoccupation with the self (17,32,40,41).

**SOURCE:** Office of Technology Assessment, 1991, based on S. Harter, “Adolescent Self and Identity Development,” *At the Threshold: The Developing Adolescent*, S.S. Feldman and G.R. Elliott (eds.) (Cambridge, MA: Harvard University Press, 1990).

the adults in their lives. For example, while Keating’s review concludes that, in general, the 11- to 14-year-old range is the period during which a minority of generally successful reasoners becomes a majority, he also finds some evidence that there is a period in early adolescence that Keating terms “rampant relativism. That is, when early adolescents first begin correctly to give a ‘can’t tell’ response to logical syllogisms, they also give such an answer when, indeed, there is a valid conclusion—and one that younger children can infer (43). Keating suggests that this may be a necessary cost of becoming a critical reasoner. Additional research is needed on this apparent propensity to question everything, which is a familiar one to parents of early adolescents. Box 2-B suggests some of the necessary difficulties adolescents face as they apply

cognitive changes to the process of thinking about themselves.

The origins of these new or more developed abilities and strategies are an important research question with practical implications for educating adolescents and for their abilities to make decisions affecting their health. For example, whether and how physiological and cognitive changes may be related is still a matter in dispute (19,43,68).<sup>26</sup> According to Keating, the available evidence indicates that changes in cognitive ability occur gradually with age and over time, rather than showing a sudden onset or irreversible stepwise increments (43,89). But, as Keating notes, at the beginning of the 1980s, research on adolescent thinking could easily have been organized around a few central questions, but

<sup>26</sup>For example, Susman and her colleagues note that gonadal steroids are thought to affect brain development during adolescence, and changes in cognitive abilities are hypothesized to be related to changes in gonadal steroids, although the findings reviewed by Susman and her colleagues in 1987 were not consistent across studies (68). According to Keating, while theories of brain maturation associated with pubertal development continue to arise, the evidence has not been found sufficient to support some of the changes in educational policy that have been suggested (43).

“since then, **accumulating** evidence from a variety of perspectives has strikingly expanded the questions that must be considered and [has] made consensus a more distant goal” (43).

One major change in conceptualizations of adolescent thinking has been the lack of independent support for Piagetian stage theories of cognitive development. Piaget theorized that the changes in thought processes in adolescence reflected internal structural changes in the ability to think logically *regardless of content*. Although Piaget, his colleagues, and others found evidence of sequential *changes in* children’s abilities to make logical inferences, the identification of structural changes in logic as the source of the age-related changes has proved problematic (43).<sup>27</sup> There are other potential limitations on the cognitive abilities of younger children that researchers have not been able to rule out as accounting for changes in individuals’ cognitive abilities, such as memory capacity or efficiency, content knowledge differences, and task familiarity (43).

There is a practical implication of the lack of evidence for cognitive developmental stages as such. One common use of the Piagetian model was to view age-related shifts as placing *limits* on the ability of adolescents to think logically or critically (43).<sup>28</sup> On the contrary, much of the research has shown that “supportive contexts and early attention to the development of reasoning are precisely what is required to increase the likelihood of its emergence” (43). For example, Vygotsky has found that many differences in cognitive performance may be related to identifiable features of the cognitive environment (86,44).

Nonetheless, Keating concludes that the current research provides “encouraging” evidence that higher order thinking among adolescents is *attainable*

(43). The caution, he says, is that desirable cognitive outcomes are neither easily nor automatically attainable. Positive outcomes have largely been achieved in controlled situations in which ample time is given to solve problems. In the real world, adolescents’ and adults’ “spontaneous thinking” is rarely as systematic, reflective, or intentional as in controlled situations (14).<sup>29</sup> At a practical level, then,

... it would be foolhardy to assume that cognitive interventions for adolescents could rely on highly active and reflective engagement with demanding material. Yet attempts to encourage such higher-level engagement, if carried out systematically, do offer considerable promise.

The implications of research on adolescent thinking for the delivery of health care services and health-related education to adolescents seem clear. Adolescents cannot be expected to automatically have the cognitive wherewithal to understand disease processes and the increasingly complicated delivery of health services. As is true with adults, a certain amount of ability to draw inferences and make reasonable decisions will depend on adolescents’ experience and the *accumulation* of knowledge. The context in which the knowledge is delivered also appears to be important (86). But rather than assuming that adolescents are incapable of making health care decisions,<sup>30</sup> the working assumption might be that adolescents have the capacity and can be taught to do so in a participatory fashion (43). Certainly, it would be preferable for parents to be the teachers of this information, but often parents and children experience discomfort in discussions of sensitive topics or are themselves not knowledgeable (11).<sup>31</sup> Thus, schools and a broad range of health service providers could broaden their roles as educators. Such an expansion of roles

<sup>27</sup>The tenets of Piaget’s theory have been well-described (43). As summarized by Keating, “Piaget focused on the development and organization of logicomathematical operations through four major stages or periods: the sensorimotor functioning of infancy; the preoperational, largely egocentric thinking of early childhood; the concrete operational logic of middle and later childhood; and the formal operational logic that characterizes adolescence and adulthood” (43). Further, ‘the cognitive operations within any given stage are organized in a structure; thus, stage changes imply shifts in underlying structure brought about through the constructive interaction of the individual with the physical and social world. . . This progression is presumed to be universal and invariable’ (43).

<sup>28</sup>Similarly, Epstein’s theories about possible whole brain growth spurts inspired a move in education to delay challenging coursework until late in adolescence (19,43).

<sup>29</sup>Both Keating (43) and Koslowski and Ogaki (45) find that adolescents are more similar to, than different from, adults in drawing causal inferences. Level of education appears to make a difference as well, with non-college-educated adults scoring between sixth- and ninth-graders (47).

<sup>30</sup>The legal presumption that minors are incompetent to make health care decisions is discussed in ch. 17, “Consent and Confidentiality in Adolescent Health Care Decisionmaking,” in Vol. III (75a).

<sup>31</sup>Also see ch. 3, “Parents and Families’ Influence on Adolescent Health,” in this volume.



Photo credit: Benjamin Smith

Available evidence suggests that higher-order thinking among adolescents is attainable, but it is neither easily nor automatically achieved. Attempts to encourage higher level cognitive engagement require intensive, systematic efforts that involve real-world content.

would, however, have training<sup>32</sup> and cost implications.

### ***A Perspective on Adolescent Risk-Taking***

An area important to the delivery of health services (particularly health education) that is related to research on cognitive development is the area of adolescent *risk-taking*.<sup>33</sup> As noted in a recent review of adolescent risk-taking by Furby and Beyth-Marom, "Although there is little empirical research on adolescent decisionmaking and risk

taking, there is no paucity of beliefs about how to characterize adolescent behavior in these areas' (26b). In their review of the empirical literature relevant to these beliefs,<sup>34</sup> Furby and Beyth-Marom conclude:

... there is as yet little evidence that adolescents are more likely than adults to engage in behavior that seems risky to them. That is, there is little evidence that they seek out or are willing to accept greater risks. However, neither is there clear evidence that they do not seek or accept greater risks. The lack of empirical evidence on this issue reflects, in large part, the dearth of information on how adolescents (and adults) perceive the options they do consider [and] the likelihood of [the options'] possible consequences. . . This lack of information on option and consequence perception and evaluation is not surprising, given the methodological difficulties involved in measuring these variables. However, without better evidence, it is hard to justify the [perception] that teenagers are particularly prone to seek out or accept risks. . . (26b).

Knowledge about adolescent risk-taking and decisionmaking is important in considerations of adolescent health policy. For example, Furby and Beyth-Marom raise the possibility that, instead of being poor decisionmakers, many adolescents may be making rational decisions, *given the existing conditions and contingencies* (26b).<sup>35</sup> If adolescents are engaging in faulty decisionmaking, it seems reasonable to focus on improving their capacity to make better health-related choices, for example,

<sup>32</sup>For example, Keating notes two findings with implications for an intensity of effort: 1) that modest interventions have little impact (in improving formal logic); and 2) that the greatest difficulties arise when individuals are asked to reason in tasks for which there is no real content. Those who become involved in improving adolescents' cognitive development would also have to be aware of other purported aspects of adolescent thinking that may affect adolescents' abilities to make rational health-related decisions: adolescents appear to have great difficulty in attempting to achieve an integrated understanding of their personal and social experiences (32,42,64) and adolescents may have a specific form of egocentrism in which they assume themselves to be the focus of most other people's perspectives much of the time (17). (Keating notes that the latter model is intuitively appealing but has little empirical support (43).)

<sup>33</sup>Furby and Beyth-Marom provide definitions of risk and risky behavior: "The term *risk* refers to a chance of loss, that chance being greater than 0 percent but less than 100 percent. Thus, the definition of *risky behavior* . . . is action (or inaction) that entails a chance of loss' (26b). They note that risk taking "may or may not be deliberate. That is, one may or may not be conscious that a given behavior entails a non-zero probability of loss' (26b). Furby and Beyth-Marom's perspective on risk taking is based on a decision-making perspective: "Decision theorists define decision making as the process of making choices among competing courses of action. . . The normative models of decision theory prescribe the processes that people should follow in order to have the best chance of maximizing their well-being, given their beliefs and values" (26b). (Furby and Beyth-Marom also provide a review of other perspectives on risk taking (e.g., risk taking as sensation-seeking).)

<sup>34</sup>The following, according to Furby and Beyth-Marom, are some common myths about adolescent decisionmaking and risk-taking: 1) adolescents are not capable of competent decisionmaking; 2) adolescents take more risks than do adults, and their risk taking endangers their well-being; 3) adolescents do not consider sufficiently those possible consequences (of various options) that might occur in the distant future; 4) adolescents think that they are invulnerable; 5) adolescents let emotions rule their choices; 6) adolescents rely heavily on peer information and attitudes when making decisions about risky behavior (26 b),

<sup>35</sup>For example, if all known alternative outcomes are taken into account, it may seem most rational to an adolescent female to bear a child. An abused adolescent may seek refuge in the use of alcohol or illicit drugs. Reviews of risk factors and preventive interventions related to selected adolescent health concerns can be found throughout this volume and in Vol. I of this Report (75).

with training in decisionmaking.<sup>36</sup> If, on the other hand, adolescents are, from their own perspectives, making rational choices, the emphasis should be on encouraging changes in the social structure that would make health-generating choices more likely among adolescents (26b).<sup>37</sup>

A potential implication of realistically evaluating the literature on adolescent decisionmaking and risk-taking relates to adults' attitudes towards adolescents and towards particular activities. As have adolescents themselves (74a), Furby and Beyth-Marom note inconsistencies in societal attitudes around sexuality, drug use, and risk taking in general, suggesting that adults may have concerns other than adolescents' health:<sup>38</sup>

Exactly what these other concerns are is an open question, . . . Perhaps it is somewhat threatening to adults to see their children acquiring this new (and more equal) status. Or, perhaps these are simply behaviors about which adults are quite ambivalent themselves, being uncertain whether to condemn or condone them even in adults (26b).

A considerable amount of additional research and thinking needs to be done with respect to conceptualizations of adolescent decisionmaking and risk-taking.<sup>39</sup>

### Summary

Adolescence is a period of profound biological, emotional, intellectual, and social transformation, which appears to be lengthening as a result of national economic demands. One difficulty in gaining the attention of policymakers for some adolescent health concerns is that adolescence is often viewed solely as a transitional period between childhood and adulthood (93). But this "transitional period" can take as long as one-seventh of the

typical life span. One can argue—without coming to the conclusion that to be normal in adolescence is in itself abnormal (26a) (and, perhaps, therefore, that striking aberrations in behavior, should be ignored (88))—that contemporary adolescents deserve sympathetic societal attention, including attention to their perspectives on health, during their second decade of life.

### Defining Adolescent Health

As noted in the introduction to this chapter, definitions of health have important implications for:

- judgments about the health status of any particular group;
- judgments about what health-related services and policies are justified; and
- decisions about the development of indicators of health status that are in turn used to help judge the need for services and policies.

For adolescents, these implications translate to: How healthy are adolescents? What kinds of interventions, if any, should be developed to improve their health? How shall the health of adolescents—and the effectiveness of interventions—be monitored?<sup>40</sup> Hence, an understanding of contemporary conceptualizations of health, and of their implications for the allocation of health-related resources, is important.

### Current Conceptualizations of Health

As is adolescence, the concept of health is socially defined and subject to change. To some extent, adolescents have been affected by recent reconceptualizations of health and attributions of responsibility for health status.

<sup>36</sup>As discussed below, this approach is part of the approach to health improvement that emphasizes individual responsibility.

<sup>37</sup>This corresponds to the health protection approach to prevention, described below and in Furby and Beyth-Marom (26b).

<sup>38</sup>For example, ". . . the considerable controversy over whether to make contraceptives easily available to teenagers suggests that there may be something other than the risk of pregnancy that bothers adults about adolescents being sexually active. Likewise, the much greater concern expressed about the risks some adolescents take by smoking marijuana than about the risks many more adults take by drinking alcohol, . . . suggests that there may be something other than the possibility of negative behavioral health effects that bothers adults about adolescents' smoking marijuana" (26b).

<sup>39</sup>Suggested directions for future research can be found in Furby and Beyth-Marom (26b).

<sup>40</sup>These questions are addressed throughout this Report.

A complete history of evolving conceptions of health is beyond the scope of this Report.<sup>41</sup> In the past century, as measures such as improved sanitation, and later, immunizations against bacterial and some infectious diseases have helped to improve life expectancy,<sup>42</sup> there has come to be more of an emphasis on nonphysical aspects of health and on the notion that much disease and disorder is avoidable (5a,53a,77,82a). For example, in 1948 the World Health Organization (WHO) defined health as “complete physical, mental, and social well-being, not merely the absence of disease or infirmity” (33). While the WHO definition has not been completely adopted, the accepted definition of health is, according to some observers, evolving toward including well-being as well as the absence of disease (8).

The idea that, especially for younger people, “natural” causes of death, disease, and disability had been largely replaced by mortality and morbidity related to behavior is an idea that has taken hold in the last 15 or so years (e.g., 56,60,82). However, most health data systems, health care systems, and insurance reimbursement arrangements in the United States continue to emphasize care for physical illness.<sup>43</sup>

The idea that much premature death, disability, and disease is largely avoidable (and even associated with behavior) should not lead *exclusively* to the

notion that preventable avoidable death and disability are the sole responsibility of the individual. For example, a 1979 U.S. Surgeon General’s report placed approximately equal emphasis on societal measures to protect the health of the U.S. population (“health protection”), on health promotion, and on prevention of specific diseases and disorders (77).<sup>44</sup> By at least 1984, however, many in the field of public health had come to recognize that much of the responsibility in health promotion and prevention had fallen to individual, rather than collective, action (5a,73) and one of the main objectives of a WHO conference in the mid-1980s was “to shift the focus from individualistic explanations of variations in health to an awareness of *the public policies* which were necessary to promote and protect health” (5a emphasis added). Thus it was at the 1984 conference that the idea of the “healthy city” (later to become the “healthy community”) took root as a WHO strategy for promoting health for all by the year 2000 (5a).

The notion that the health of adolescents is also grounded in the health of their communities is one that may be gaining momentum (e.g., 78a). For example, a recent publication by the Office of Substance Abuse Prevention in the U.S. Department of Health and Human Services sought to “provide balance to the public health model of agent, host, and

<sup>41</sup> Ashton recently delineated four phases in *public health* from the 1840s until the 1970s that may be useful in providing some historical context: 1) the period of *sanitary reform* (1840-1900), which responded to the miserable living conditions for the urban poor arising from the rapid urbanization that accompanied the industrial revolution (see above); 2) the period of *personal prevention opportunities* (e.g., child and family health clinics; birth control services; the provision of free milk and meals in schools) (1880-1930) that arose with advances in bacteriology and the development of immunization 3) the *therapeutic era* (1930-1974) that arose with the advent of insulin, antimicrobial, and a later explosion of other therapeutic possibilities, which in turn, according to Ashton, coincided with “the apparent disappearance of the major infectious diseases on the one hand, and the increasing involvement of governments in the provision of health and social services on the other”; and 4) the *new public health movement* (1975-present), which can be traced to increases in longevity, recognition that a great deal of premature death and disability was avoidable, and growing awareness of the limitations of therapy (5a,53a).

<sup>42</sup> The life expectancy of an average American (all races, both genders) born in 1988 was 74.9 years; in comparison, the life expectancy of an average American born in the period 1900 was approximately 47.3 years (82a). (The figure for 1900 is approximate because it included only the U.S. “death registration area” of 10 States and the District of Columbia (82a).) In both 1988 and 1900, the life expectancy of nonwhite Americans was lower than that of whites, although the gap narrowed between 1900 and 1988. For example, in 1988, the life expectancy for black Americans was 69.2 years; in 1900, the life expectancy for Americans of “all other” races than white was 33.0 years (82a). Figures specifically for black Americans are not available for the year 1900.

<sup>43</sup> For examples, see ch.15, “Major Issues Pertaining to the Delivery of primary and Comprehensive Health Services to Adolescents,” and ch.16, “Financial Access to Health Services,” in Vol. III.

<sup>44</sup> *Health protection* comprises strategies for health promotion and disease prevention that are related to environmental or regulatory measures that confer protection on large population groups. As most broadly defined *health promotion* is a philosophy of health or a set of activities that takes as its aim the promotion of health, not just the prevention of disease; WHO has defined health promotion as the “process of enabling people to increase control over and improve their health” (5a). Sometimes, however, health promotion is more narrowly defined as the set of prevention efforts aimed at changing individual behavior. *Prevention* is used most often to refer to primary prevention which is a category of health and related interventions that aim to eliminate a disease or disordered state before it can occur.



environment by targeting the environment” (78a). However, relatively few of the *Healthy People 2000* national objectives related to adolescents (or to other age groups) were objectives requiring environmental or regulatory measures to improve health (82b).

## Measures of Health

### Measures of the Health of Individuals

In no sense have widely published *measures* of health status in the United States approached broader and more positive definitions of health (8).<sup>46</sup> In the United States, the health status of the population is still measured primarily in terms of mortality or is inferred from the extent to which individuals seek care from physicians (e.g., 82a).<sup>47 48</sup> There is increasing publication of behavioral risk factors as indicators of the health of the U.S. population (79).

Measures that are limited to the absence of physical health problems can be used to infer that U.S. adolescents as a group are healthy and, therefore, that they may not require health care services and other health-related resources (37,88). As noted above, a potential problem with an exclusive emphasis on individual behaviors, however, is that social and environmental factors that play a role in eliciting individual behaviors may be overlooked (8,73).

### Measures of the Social Environment

The literature on health does not typically include objective measures of social and physical environments and the ways in which those factors affect adolescent health.<sup>49</sup> For example, precious little research has been done on how adolescents perceive their environments and the effects those perceptions have on their health (for examples of exceptions, see 20,85).<sup>50</sup>

The evidence that is available suggests that adolescents believe that there is considerable social ambivalence when it comes to adolescent behavior such as sexuality, alcohol, tobacco, and drug use, and other risk-taking behaviors (e.g., dangerous driving practices) (74a),<sup>51</sup> that many adults do not really care about them (85), that health care providers do not discuss the issues of concern to them (36,48,66),<sup>52</sup> and that many adults seem only to see the negative when it comes to adolescents (34). Adult observers have also noted that public attitudes toward adolescents are, if not negative, then largely unsympathetic (7,65).

### Factors Affecting Conceptualizations of Adolescent Health

Apart from considerations of adolescence as a period of life, additional issues relating to the definition of adolescent health include: who defines health and health problems, the social context of the definition of health problems, difficulties in opera-

<sup>45</sup>For an analysis of the Healthy People 2000 objectives pertaining to adolescents, see the discussion of Major option 3 in Vol. I, ‘Summary and Policy Options,’ of this Report.

<sup>46</sup>For a synthesis and critique of widely published measures of adolescent health, see app. C, “Issues Related to the Lack of Information About Adolescent Health and Health and Related Services,” in Vol. I.

<sup>47</sup>The presence of a mental health problem is also considered an aspect of health (56), although Federal overviews of the health status of the population rarely include information on mental health status measures (e.g., 82a). Further, many adolescent mental disorders are defined in behavioral terms (5).

<sup>48</sup>Additional issues concerning the information available about adolescent health status, even using widely accepted indicators as measures, are discussed in app. C, “Issues Related to the Lack of Information About Adolescent Health and Health and Related Services,” in Vol. I.

<sup>49</sup>Ajzen notes that measurement of social and contextual factors in health and human behavior is underdeveloped (1). Although the health of communities as well as that of individuals is becoming an additional focus in changing conceptualizations of health (8), measures of a community’s health appear at this point to be limited to aggregations of the health status of the community’s individual members (8). For example, a recent ‘consensus set of indicators for assessing community health status’ published by the Centers for Disease Control in the U.S. Department of Health and Human Services, includes only one measure of the physical environment (proportion of persons living in counties exceeding U.S. Environmental Protection Agency standards for air quality during the previous year) and one measure of the socioeconomic environment (childhood poverty, as measured by the proportion of children less than 15 years of age living in families at or below the poverty level) among 18 suggested indicators (81). Nine of the indicators are mortality rates, 4 are reported incidence rates for physical illnesses (i.e., acquired immunodeficiency syndrome, measles, tuberculosis, and primary and secondary syphilis), and 3 are “indicators of risk factors” (i.e., incidence of low birth weight, births to adolescents, and lack of prenatal care) (81).

<sup>50</sup>Also see app. A, “Method of the Study,” in Vol. I (75).

<sup>51</sup>For example, OTA’s Youth Advisory Panel pointed out that while they are formally instructed to abstain from sex, drinking, and drugs, they are bombarded daily with contradictory messages from the adult-controlled media.

<sup>52</sup>For discussion of these studies, and analyses of the competence of health care providers in treating adolescents, see ch. 6, “Chronic Physical Illnesses: Prevention and Services,” in this volume, and ch. 15, “Major Issues Pertaining to the Delivery of Primary and Comprehensive Health Services to Adolescents,” in Vol. III.

tionalizing well-being, and the potential consequences of broadening the definition of adolescent health.

The way that adolescent health and health problems are defined and measured greatly influences adolescents' lives, but as a generally (legally) powerless group, adolescents have very little say in the way health and health problems are defined and measured. As noted above, adolescents have been found to see discrepancies between issues of concern to them and issues likely to be discussed by health care providers and others who have the potential to affect adolescent health and make referrals to health care services. Clearly, if there is disagreement on what adolescent health and health problems are, there is likely to be disagreement on appropriate approaches to promoting health and to addressing problems.

Another factor in defining adolescent health problems is some things that are regarded as adolescent health problems are problems only in the context of the contemporary social environment (55). Possibly, for example, dropping out of high school (or not going on to college) might not be so terrible for some adolescents if jobs at living wages or other alternatives were available (87) or if academic paths were more flexible. The social environment is the product of longstanding cultural and philosophical roots in this country that are not about to be changed in a wholesale manner (9,55), but in considering what an adolescent health problem is, it is important to recognize the social environment's impact on the way adolescent health problems are defined.

A related social dilemma concerns operationalizing the concept of "complete . . . well-being" or "optimal functional status" (33,37). Although broadly acceptable definitions of complete well-being could be socially constructed, they would be difficult to devise because to a large extent complete well-being is inherently a subjective notion. Findings such as those by Malus and colleagues suggest, for example, that, in contrast to health care providers, adolescents perceived sexual intercourse, alcohol and drug use, as common occurrences, but not serious health problems (48). Malus's findings suggest a gulf between adult and adolescent perceptions of adolescent well-being. Broadening the definition of health can have implications for the organization of health services and, as a consequence, cost implications.

## Summary

Clearly, the issue of defining health as a general matter across the life-span-and all the implications of that definition for intervention and resource allocation-is not yet settled. Scholars in the field of adolescent health, realizing the limitations of more traditional definitions of health and health-related interventions for that group, seem considerably more inclined to subscribe to broad definitions such as WHO'S. For example, Irwin argues that a reconceptualization of adolescent health as "optimal functional status" may provide a better understanding of the broader issues affecting adolescents' health (37,53).

Issues surrounding the definition and measurement of adolescent health may receive greater attention as the findings of OTA's Report, and others related to adolescent health (e.g., 3,4,12,15,54,57, 58,59,60), are considered by local and national policymakers, parents, researchers, and adolescents themselves. Many of these issues are relevant to populations other than adolescents, but a broader definition of health is especially important for adolescents because adolescence is both a critical transitional period (24,29) and a period that comprises perhaps one-seventh of the life span, and because narrower definitions of health can lead to the neglect of important health issues during adolescence (88).

## Conclusions and Policy Implications

The discussion of adolescent development in the first part of this chapter, as well as discussions of specific health and related topics later in this volume, suggest that, in attempts to define health for adolescents, is important to consider a broad range of issues and to include measures of adolescents' sense of well-being, their social environments, as well as the more familiar individual measures of physical illness, mortality, and behavioral risk factors. However, OTA found during its assessment that existing quantitative assessments of adolescent health, and even attempts to further develop definitions of adolescent health have not caught up with the conclusion that adolescent health needs to be thought of broadly (37,56).

Throughout this Report, OTA attempts to take a broad view of adolescent health. Health is viewed in this Report in the most "traditional" terms of the presence or absence of physical disease and

**Box 2-C--Toward Improving Adolescent Health: Key Concepts Developed by Adolescent Health Scholars at the 1986 National Invitational Conference on the Health Futures of Adolescents**

1. **Provide a prolonged supportive environment for adolescents** Healthy adolescent development is fostered by providing a prolonged supportive environment during early adolescence, with graded steps toward autonomy.

2. **Devise a precise conceptualization of risk-taking behavior.** Positive as well as negative developmental and healthy outcomes are associated with certain exploratory behaviors. A more precise conceptualization of "risk taking" is needed to study and distinguish between constructive exploration and potentially destructive behaviors occurring during adolescence.

3. **Increase the focus on positive aspects of adolescence.** The major biological and psychosocial changes occurring during adolescence are not necessarily associated with negative outcomes and instability. Adolescence is not necessarily turbulent. Understanding positive growth, the acquisition of new skills and health-promoting behaviors, and the changing nature of interpersonal relationships deserves increased attention.

4. **Mutually engage with adolescents in a positive way.** Healthy development is encouraged by a process of mutual, positive engagement between the adolescent and various adults and peers. This process should occur through family and other significant adults and take place in schools, health institutions, and the community.

5. **Study adolescence in multiple contexts.** Healthy development must be studied and viewed in relation to the various contexts within which it occurs. Demographic, socioeconomic, psychological, biological, sociological, and historical factors can modify the characterization of normal development.

SOURCE: C. Irwin, "Editor's Notes," *Adolescent Social Behavior and Health* (San Francisco: Jossey-Bass, Inc., 1987).

disability; the implications of that view for interventions and the allocation of resources are discussed. As has become well-accepted in the adolescent development and health research communities, the health of adolescents is also viewed in this Report in behavioral terms—such as engagement in behaviors variously characterized as "risky," "health-compromising," "health-enhancing," or "problem" behaviors. The Report also attempts to measure health in positive terms (e.g., social competence) and health and well-being from the perspective of adolescents themselves (e.g., perceived quality of life). The influence of the social context on health-related behaviors is also discussed (e.g., families, schools, discretionary time).

In many cases, however, OTA's attempt at a broad analysis of adolescent health was hampered by a lack of data. The future of monitoring adolescent health needs to take a well-rounded approach to measuring health and the factors that affect it, rather than continuing its emphasis on mortality and behavior. In addition, the differences that occur during the long (10 or more years) period of

adolescent development (e.g., 13) are important to integrate into an agenda for monitoring adolescent health and well-being.

In addition, it is important to continue the "renaissance" in research on normal adolescent development noted recently by the Carnegie Council on Adolescent Development (24,25,89). The Carnegie volume suggests many opportunities for such research and emphasizes three priority areas of crosscutting importance (24,25).<sup>53</sup>

In order to make adolescence a better period of life, it may also be important to attempt to 'market' adolescents differently to the American public and to health care providers. As discussed above, many earlier hypotheses that seemed to describe universal processes in adolescent development have now been tested and found wanting (24). In the process of testing grand theories, the field of adolescent development has found that the popular conceptions of adolescents as a group whose behavior is overwhelmingly determined by "raging hormones" and of adolescence as inevitably a period of storm and stress are overstated. But on the other hand, the rapid

<sup>53</sup>According to Feldman and Elliott, the three crosscutting areas of primary importance are: learning more about nonwhite youth; examining the contexts of adolescent development and considering adolescence as part of the life course (24,25). Suggestions for future research can also be found in various reports from the 1986 National Invitational Conference on Health Futures of Adolescents (e.g., 37,39) and in recent review by Susman and her colleagues (68).

physical change that occurs during adolescence, and the increasing ability of adolescents to think reflectively, can make adolescence a difficult period for some individuals, their parents, teachers, other adults, and their peers. Little help is provided to adolescents, and their parents and teachers, as they try to cope with these changes. Societal expectations for adolescents are inconsistent and may simultaneously restrict adolescents unnecessarily and demand from them an unrealistic level of maturity.

It is important to consider the basic physiological and cognitive changes that occur during adolescence in the design of health and related services, health education, and adolescent environments generally. It is important to continuously acknowledge that adolescence is largely a social construct, and one that is continuously changing, even as we study it (55). As a starting place, the key concepts developed by participants in the 1986 National Invitational Conference on the Health Futures of Adolescents deserve additional application and testing (box 2-C).

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