CENGAGE

Community Nutrition in Action

8TH EDITION

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Dietary Reference Intakes (DRIs)

The Dietary Reference Intakes (DRIs) include two sets of values that serve as goals for nutrient intake—Recommended Dietary Allowances (RDAs) and Adequate Intakes (AIs). The RDA reflects the average daily amount of a nutrient considered adequate to meet the needs of most healthy people. If there is insufficient evidence to determine an RDA, an AI is set. The DRIs also include a set of values called Tolerable Upper Intake Levels (ULs). The UL represents the maximum amount of a nutrient that appears safe for most healthy people to consume on a regular basis. Turn the page for a listing of the ULs for selected vitamins and minerals. As the DRI are reviewed and updated, a new DRI category will be considered for all nutrients. The new DRI, called the Chronic Disease Risk Reduction Intake (CDRR), will reflect nutrient intake levels associated with a low risk of a chronic disease (e.g., sodium and hypertension).

Estimated Energy Requirements (EERs), Recommended Dietary Allowances (RDAs), and Adequate Intakes (AIs) for Water, Energy, and the Macronutrients

Life-Stage Group	Reference BMI (kg/m^2)	Reference height, cm (in)	Reference weight, kg (lb)	Water[a] AI (L/day)	Energy EER[b] (kcal/day)	Carbohydrate RDA (g/day)	Total fiber AI (g/day)	Total fat AI (g/day)	Linoleic acid AI (g/day)	Linolenic acid[c] AI (g/day)	Protein RDA (g/day)[d]	Protein RDA (g/kg/day)	
Males													
0–6 mo	—	62 (24)	6 (13)	0.7[e]	570	60	—	31	4.4	0.5	9.1	1.52	
7–12 mo	—	71 (28)	9 (20)	0.8[f]	743	95	—	30	4.6	0.5	11	1.2	
1–3 y[g]	—	86 (34)	12 (27)	1.3	1046	130	19	—	7	0.7	13	1.05	
4–8 y[g]	15.3	115 (45)	20 (44)	1.7	1742	130	25	—	10	0.9	19	0.95	
9–13 y	17.2	144 (57)	36 (79)	2.4	2279	130	31	—	12	1.2	34	0.95	
14–18 y	20.5	174 (68)	61 (134)	3.3	3152	130	38	—	16	1.6	52	0.85	
19–30 y	22.5	177 (70)	70 (154)	3.7	3067[h]	130	38	—	17	1.6	56	0.8	
31–50 y	22.5[i]	177 (70)[i]	70 (154)[i]	3.7	3067[h]	130	38	—	17	1.6	56	0.8	
≥ 51 y	22.5[i]	177 (70)[i]	70 (154)[i]	3.7	3067[h]	130	30	—	14	1.6	56	0.8	
Females													
0–6 mo	—	62 (24)	6 (13)	0.7[e]	520	60	—	31	4.4	0.5	9.1	1.52	
7–12 mo	—	71 (28)	9 (20)	0.8[f]	676	95	—	30	4.6	0.5	11	1.2	
1–3 y[g]	—	86 (34)	12 (27)	1.3	992	130	19	—	7	0.7	13	1.05	
4–8 y[g]	15.3	115 (45)	20 (44)	1.7	1642	130	25	—	10	0.9	19	0.95	
9–13 y	17.4	144 (57)	37 (81)	2.1	2071	130	26	—	10	1.0	34	0.95	
14–18 y	20.4	163 (64)	54 (119)	2.3	2368	130	26	—	11	1.1	46	0.85	
19–30 y	21.5	163 (64)	57 (126)	2.7	2403[j]	130	25	—	12	1.1	46	0.8	
31–50 y	21.5[i]	163 (64)[i]	57 (126)[i]	2.7	2403[j]	130	25	—	12	1.1	46	0.8	
≥ 51 y	21.5[i]	163 (64)[i]	57 (126)[i]	2.7	2403[j]	130	21	—	11	1.1	46	0.8	
Pregnancy													
1st trimester				3.0	+0	175	28	—	13	1.4	71	1.1	
2nd trimester				3.0	+340	175	28	—	13	1.4	71	1.1	
3rd trimester				3.0	+452	175	28	—	13	1.4	71	1.1	
Lactation													
1st six months postpartum				3.8	+330	210	29	—	13	1.3	71	1.3	
2nd six months postpartum				3.8	+400	210	29	—	13	1.3	71	1.3	

Note: For all nutrients, values for infants are AIs. Dashes indicate that values have not been determined.

[a] The water AI includes drinking water, water in beverages, and water in foods; in general, drinking water and other beverages contribute about 70 to 80%, and foods, the remainder. Conversion factors: 1 L = 33.8 fluid oz; 1 L = 1.06 qt; 1 cup = 8 fluid oz.

[b] The Estimated Energy Requirement (EER) represents the average dietary energy intake that will maintain neutral energy balance in a healthy person of a given sex, age, weight, height, and physical activity level. The values listed are based on an "active" person at the reference height and weight and at the midpoint ages for each group until age 19. Go to *www.choosemyplate.gov* for tools to determine Estimated Energy Requirements.

[c] The linolenic acid referred to in this table and text is the omega-3 fatty acid known as alpha-linolenic acid.

[d] The values listed are based on reference body weights.

[e] Assumed to be from human milk.

[f] Assumed to be from human milk and complementary foods and beverages. This includes approximately 0.6 L (~3 cups) as total fluid including formula, juices, and drinking water.

[g] For energy, the age groups for young children are 1–2 years and 3–8 years.

[h] For males, subtract 10 kilocalories per day for each year of age above 19.

[i] Because weight need not change as adults age if activity is maintained, reference weights for adults 19 through 30 are applied to all adult age groups.

[j] For females, subtract 7 kilocalories per day for each year of age above 19.

Source: Adapted from the *Dietary Reference Intakes* series, National Academies Press. Copyright 1997, 1998, 2000, 2001, 2002, 2004, 2005, 2011 by the National Academy of Sciences. National Academies of Sciences, Engineering, and Medicine. 2019. *Dietary Reference Intakes for Sodium and Potassium*. Washington, DC: The National Academies Press.

Recommended Dietary Allowances (RDAs) and Adequate Intakes (AIs) for Vitamins

Life-Stage Group	Thiamin RDA (mg/day)	Riboflavin RDA (mg/day)	Niacin RDA (mg/day)[a]	Biotin AI (μg/day)	Pantothenic acid AI (mg/day)	Vitamin B_6 RDA (mg/day)	Folate RDA (μg/day)[b]	Vitamin B_{12} RDA (μg/day)	Choline AI (mg/day)	Vitamin C RDA (mg/day)	Vitamin A RDA (μg/day)[c]	Vitamin D RDA (μg/day)[d]	Vitamin E RDA (mg/day)[e]	Vitamin K AI (μg/day)
Infants														
0–6 mo	0.2	0.3	2	5	1.7	0.1	65	0.4	125	40	400	10	4	2.0
7–12 mo	0.3	0.4	4	6	1.8	0.3	80	0.5	150	50	500	10	5	2.5
Children														
1–3 y	0.5	0.5	6	8	2	0.5	150	0.9	200	15	300	15	6	30
4–8 y	0.6	0.6	8	12	3	0.6	200	1.2	250	25	400	15	7	55
Males														
9–13 y	0.9	0.9	12	20	4	1.0	300	1.8	375	45	600	15	11	60
14–18 y	1.2	1.3	16	25	5	1.3	400	2.4	550	75	900	15	15	75
19–30 y	1.2	1.3	16	30	5	1.3	400	2.4	550	90	900	15	15	120
31–50 y	1.2	1.3	16	30	5	1.3	400	2.4	550	90	900	15	15	120
51–70 y	1.2	1.3	16	30	5	1.7	400	2.4	550	90	900	15	15	120
> 70 y	1.2	1.3	16	30	5	1.7	400	2.4	550	90	900	20	15	120
Females														
9–13 y	0.9	0.9	12	20	4	1.0	300	1.8	375	45	600	15	11	60
14–18 y	1.0	1.0	14	25	5	1.2	400	2.4	400	65	700	15	15	75
19–30 y	1.1	1.1	14	30	5	1.3	400	2.4	425	75	700	15	15	90
31–50 y	1.1	1.1	14	30	5	1.3	400	2.4	425	75	700	15	15	90
51–70 y	1.1	1.1	14	30	5	1.5	400	2.4	425	75	700	15	15	90
> 70 y	1.1	1.1	14	30	5	1.5	400	2.4	425	75	700	20	15	90
Pregnancy														
14–18 y	1.4	1.4	18	30	6	1.9	600	2.6	450	80	750	15	15	75
19–30 y	1.4	1.4	18	30	6	1.9	600	2.6	450	85	770	15	15	90
31–50 y	1.4	1.4	18	30	6	1.9	600	2.6	450	85	770	15	15	90
Lactation														
14–18 y	1.4	1.6	17	35	7	2.0	500	2.8	550	115	1200	15	19	75
19–30 y	1.4	1.6	17	35	7	2.0	500	2.8	550	120	1300	15	19	90
31–50 y	1.4	1.6	17	35	7	2.0	500	2.8	550	120	1300	15	19	90

Note: For all nutrients, values for infants are AIs.

[a] Niacin recommendations are expressed as niacin equivalents (NE), except for recommendations for infants younger than six months, which are expressed as preformed niacin.

[b] Folate recommendations are expressed as dietary folate equivalents (DFE).

[c] Vitamin A recommendations are expressed as retinol activity equivalents (RAE).

[d] Vitamin D recommendations are expressed as cholecalciferol.

[e] Vitamin E recommendations are expressed as α-tocopherol.

Recommended Dietary Allowances (RDAs) and Adequate Intakes (AIs) for Minerals

Life-Stage Group	Sodium AI (mg/day)	Chloride AI (mg/day)	Potassium AI (mg/day)	Calcium RDA (mg/day)	Phosphorus RDA (mg/day)	Magnesium RDA (mg/day)	Iron RDA (mg/day)	Zinc RDA (mg/day)	Iodine RDA (μg/day)	Selenium RDA (μg/day)	Copper RDA (μg/day)	Manganese AI (mg/day)	Fluoride AI (mg/day)	Chromium AI (μg/day)	Molybdenum RDA (μg/day)
Infants															
0–6 mo	120	180	400	200	100	30	0.27	2	110	15	200	0.003	0.01	0.2	2
7–12 mo	370	570	700	260	275	75	11	3	130	20	220	0.6	0.5	5.5	3
Children															
1–3 y	1000	1500	3000	700	460	80	7	3	90	20	340	1.2	0.7	11	17
4–8 y	1200	1900	3800	1000	500	130	10	5	90	30	440	1.5	1	15	22
Males															
9–13 y	1500	2300	4500	1300	1250	240	8	8	120	40	700	1.9	2	25	34
14–18 y	1500	2300	4700	1300	1250	410	11	11	150	55	890	2.2	3	35	43
19–30 y	1500	2300	4700	1000	700	400	8	11	150	55	900	2.3	4	35	45
31–50 y	1500	2300	4700	1000	700	420	8	11	150	55	900	2.3	4	35	45
51–70 y	1300	2000	4700	1000	700	420	8	11	150	55	900	2.3	4	30	45
> 70 y	1200	1800	4700	1200	700	420	8	11	150	55	900	2.3	4	30	45
Females															
9–13 y	1500	2300	4500	1300	1250	240	8	8	120	40	700	1.6	2	21	34
14–18 y	1500	2300	4700	1300	1250	360	15	9	150	55	890	1.6	3	24	43
19–30 y	1500	2300	4700	1000	700	310	18	8	150	55	900	1.8	3	25	45
31–50 y	1500	2300	4700	1000	700	320	18	8	150	55	900	1.8	3	25	45
51–70 y	1300	2000	4700	1200	700	320	8	8	150	55	900	1.8	3	20	45
> 70 y	1200	1800	4700	1200	700	320	8	8	150	55	900	1.8	3	20	45
Pregnancy															
14–18 y	1500	2300	4700	1300	1250	400	27	12	220	60	1000	2.0	3	29	50
19–30 y	1500	2300	4700	1000	700	350	27	11	220	60	1000	2.0	3	30	50
31–50 y	1500	2300	4700	1000	700	360	27	11	220	60	1000	2.0	3	30	50
Lactation															
14–18 y	1500	2300	5100	1300	1250	360	10	13	290	70	1300	2.6	3	44	50
19–30 y	1500	2300	5100	1000	700	310	9	12	290	70	1300	2.6	3	45	50
31–50 y	1500	2300	5100	1000	700	320	9	12	290	70	1300	2.6	3	45	50

Tolerable Upper Intake Levels (ULs) for Vitamins

Life-Stage Group	Niacin (mg/day)[a]	Vitamin B_6 (mg/day)	Folate (μg/day)[a]	Choline (mg/day)	Vitamin C (mg/day)	Vitamin A (μg/day)[b]	Vitamin D (μg/day)	Vitamin E (mg/day)[c]	
Infants									
0–6 mo	—	—	—	—	—	600	25	—	
7–12 mo	—	—	—	—	—	600	38	—	
Children									
1–3 y	10	30	300	1000	400	600	63	200	
4–8 y	15	40	400	1000	650	900	75	300	
Adolescents									
9–13 y	20	60	600	2000	1200	1700	100	600	
14–18 y	30	80	800	3000	1800	2800	100	800	
Adults									
19–70 y	35	100	1000	3500	2000	3000	100	1000	
> 70 y	35	100	1000	3500	2000	3000	100	1000	
Pregnancy									
14–18 y	30	80	800	3000	1800	2800	100	800	
19–50 y	35	100	1000	3500	2000	3000	100	1000	
Lactation									
14–18 y	30	80	800	3000	1800	2800	100	800	
19–50 y	35	100	1000	3500	2000	3000	100	1000	

[a] The ULs for niacin and folate apply to synthetic forms obtained from supplements, fortified foods, or a combination of the two.

[b] The UL for vitamin A applies to the preformed vitamin only.

[c] The UL for vitamin E applies to any form of supplemental α-tocopherol, fortified foods, or a combination of the two.

Tolerable Upper Intake Levels (ULs) for Minerals

Life-Stage Group	Sodium (mg/day)	Chloride (mg/day)	Calcium (mg/day)	Phosphorus (mg/day)	Magnesium (mg/day)[d]	Iron (mg/day)	Zinc (mg/day)	Iodine (μg/day)	Selenium (μg/day)	Copper (μg/day)	Manganese (mg/day)	Fluoride (mg/day)	Molybdenum (μg/day)	Boron (mg/day)	Nickel (mg/day)	
Infants																
0–6 mo	—[e]	—[e]	1000	—	—	40	4	—	45	—	—	0.7	—	—	—	
7–12 mo	—[e]	—[e]	1500	—	—	40	5	—	60	—	—	0.9	—	—	—	
Children																
1–3 y	1500	2300	2500	3000	65	40	7	200	90	1000	2	1.3	300	3	0.2	
4–8 y	1900	2900	2500	3000	110	40	12	300	150	3000	3	2.2	600	6	0.3	
Adolescents																
9–13 y	2200	3400	3000	4000	350	40	23	600	280	5000	6	10	1100	11	0.6	
14–18 y	2300	3600	3000	4000	350	45	34	900	400	8000	9	10	1700	17	1.0	
Adults																
19–70 y	2300	3600	2500[f]	4000	350	45	40	1100	400	10,000	11	10	2000	20	1.0	
> 70 y	2300	3600	2000	3000	350	45	40	1100	400	10,000	11	10	2000	20	1.0	
Pregnancy																
14–18 y	2300	3600	3000	3500	350	45	34	900	400	8000	9	10	1700	17	1.0	
19–50 y	2300	3600	2500	3500	350	45	40	1100	400	10,000	11	10	2000	20	1.0	
Lactation																
14–18 y	2300	3600	3000	4000	350	45	34	900	400	8000	9	10	1700	17	1.0	
19–50 y	2300	3600	2500	4000	350	45	40	1100	400	10,000	11	10	2000	20	1.0	

[d] The UL for magnesium applies to synthetic forms obtained from supplements or drugs only.

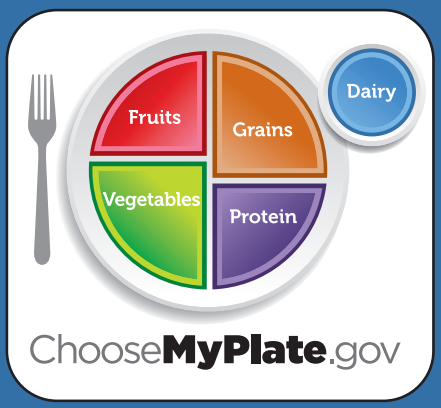
[e] Source of intake should be from human milk (or formula) and food only.

[f] The UL for calcium for 19–50 y is 2500 mg/day; the UL for calcium is reduced to 2000 mg/day for 51–70 y.

Note: An upper limit was not established for vitamins and minerals not listed and for those age groups listed with a dash (—) because of a lack of data, not because these nutrients are safe to consume at any level of intake. All nutrients can have adverse effects when intakes are excessive.

Source: Adapted with permission from the *Dietary Reference Intakes* series, National Academies Press. Copyright 1997, 1998, 2000, 2001, 2011, by the National Academy of Sciences. Courtesy of the National Academies Press, Washington, D.C.

What's on your plate?



Before you eat, think about what and how much food goes on your plate or in your cup or bowl. Over the day, include foods from all food groups: vegetables, fruits, whole grains, low-fat dairy products, and lean protein foods.

- Make half your plate fruits and vegetables.
- Make at least half your grains whole.
- Switch to skim or 1% milk.
- Vary your protein food choices.

Cut back on sodium and empty calories from solid fats and added sugars.

- Look out for salt (sodium) in foods you buy. Compare sodium in foods and choose those with a lower number.
- Drink water instead of sugary drinks. Eat sugary desserts less often.
- Make foods that are high in solid fats—such as cakes, cookies, ice cream, pizza, cheese, sausages, and hot dogs—occasional choices, not every day foods.
- Limit empty calories to less than 260 per day, based on a 2,000-calorie diet.

Be physically active your way. Pick activities you like and do each for at least 10 minutes at a time. Every bit adds up, and health benefits increase as you spend more time being active.

VEGETABLES

Eat more red, orange, and dark-green veggies like tomatoes, sweet potatoes, and broccoli in main dishes.

Add beans or peas to salads (kidney or chickpeas), soups (split peas or lentils), and side dishes (pinto or baked beans), or serve as a main dish.

Fresh, frozen, and canned vegetables all count. Choose "reduced sodium" or "no-salt-added" canned veggies.

FRUITS

Use fruits as snacks, salads, and desserts. At breakfast, top your cereal with bananas or strawberries; add blueberries to pancakes.

Buy fruits that are dried, frozen, and canned (in water or 100% juice), as well as fresh fruits.

Select 100% fruit juice when choosing juices.

GRAINS

Substitute whole-grain choices for refined-grain breads, bagels, rolls, breakfast cereals, crackers, rice, and pasta.

Check the ingredients list on product labels for the words "whole" or "whole grain" before the grain ingredient name.

Choose products that name a whole grain first on the ingredients list.

DAIRY

Choose skim (fat-free) or 1% (low-fat) milk. They have the same amount of calcium and other essential nutrients as whole milk, but less fat and calories.

Top fruit salads and baked potatoes with low-fat yogurt.

If you are lactose intolerant, try lactose-free milk or fortified soymilk (soy beverage).

PROTEIN FOODS

Eat a variety of foods from the protein food group each week, such as seafood, beans and peas, and nuts as well as lean meats, poultry, and eggs.

Twice a week, make seafood the protein on your plate.

Choose lean meats and ground beef that are at least 90% lean.

Trim or drain fat from meat and remove skin from poultry to cut fat and calories.

For a 2,000-calorie daily food plan, you need the amounts below from each food group.
To find amounts personalized for you, go to *ChooseMyPlate.gov.*

Eat 2½ cups every day.	Eat 2 cups every day.	Eat 6 ounces every day.	Get 3 cups every day.	Eat 5½ ounces every day.
What counts as a cup? 1 cup of raw or cooked vegetables or vegetable juice; 2 cups of leafy salad greens	**What counts as a cup?** 1 cup of raw or cooked fruit or 100% fruit juice; ½ cup dried fruit	**What counts as an ounce?** 1 slice of bread; ½ cup of cooked rice, cereal, or pasta; 1 ounce of ready-to-eat cereal	**What counts as a cup?** 1 cup of milk, yogurt, or fortified soymilk; 1½ ounces natural or 2 ounces processed cheese	**What counts as an ounce?** 1 ounce of lean meat, poultry, or fish; 1 egg; 1 Tbsp peanut butter; ½ ounce nuts or seeds; ¼ cup beans or peas

Body Mass Index (BMI)

	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Height	**Body Weight (Pounds)**																						
4′10″	86	91	96	100	105	110	115	119	124	129	134	138	143	148	153	158	162	167	172	177	181	186	191
4′11″	89	94	99	104	109	114	119	124	128	133	138	143	148	153	158	163	168	173	178	183	188	193	198
5′0″	92	97	102	107	112	118	123	128	133	138	143	148	153	158	163	168	174	179	184	189	194	199	204
5′1″	95	100	106	111	116	122	127	132	137	143	148	153	158	164	169	174	180	185	190	195	201	206	211
5′2″	98	104	109	115	120	126	131	136	142	147	153	158	164	169	175	180	186	191	196	202	207	213	218
5′3″	102	107	113	118	124	130	135	141	146	152	158	163	169	175	180	186	191	197	203	208	214	220	225
5′4″	105	110	116	122	128	134	140	145	151	157	163	169	174	180	186	192	197	204	209	215	221	227	232
5′5″	108	114	120	126	132	138	144	150	156	162	168	174	180	186	192	198	204	210	216	222	228	234	240
5′6″	112	118	124	130	136	142	148	155	161	167	173	179	186	192	198	204	210	216	223	229	235	241	247
5′7″	115	121	127	134	140	146	153	159	166	172	178	185	191	198	204	211	217	223	230	236	242	249	255
5′8″	118	125	131	138	144	151	158	164	171	177	184	190	197	203	210	216	223	230	236	243	249	256	262
5′9″	122	128	135	142	149	155	162	169	176	182	189	196	203	209	216	223	230	236	243	250	257	263	270
5′10″	126	132	139	146	153	160	167	174	181	188	195	202	209	216	222	229	236	243	250	257	264	271	278
5′11″	129	136	143	150	157	165	172	179	186	193	200	208	215	222	229	236	243	250	257	265	272	279	286
6′0″	132	140	147	154	162	169	177	184	191	199	206	213	221	228	235	242	250	258	265	272	279	287	294
6′1″	136	144	151	159	166	174	182	189	197	204	212	219	227	235	242	250	257	265	272	280	288	295	302
6′2″	141	148	155	163	171	179	186	194	202	210	218	225	233	241	249	256	264	272	280	287	295	303	311
6′3″	144	152	160	168	176	184	192	200	208	216	224	232	240	248	256	264	272	279	287	295	303	311	319
6′4″	148	156	164	172	180	189	197	205	213	221	230	238	246	254	263	271	279	287	295	304	312	320	328
6′5″	151	160	168	176	185	193	202	210	218	227	235	244	252	261	269	277	286	294	303	311	319	328	336
6′6″	155	164	172	181	190	198	207	216	224	233	241	250	259	267	276	284	293	302	310	319	328	336	345
	Under-weight (< 18.5)	**Healthy Weight** (18.5–24.9)						**Overweight** (25–29.9)					**Obese** (≥ 30)										

Find your height along the left-hand column and look across the row until you find the number that is closest to your weight. The number at the top of that column identifies your BMI. The area shaded in green represents healthy weight ranges.

Source: Evidence Report of Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults, 1998. NIH/National Heart, Lung, and Blood Institute.

Key Physical Activity Guidelines for Adults

Type of Physical Activity	Examples	Duration/Frequency	Benefits
Moderate-intensity aerobic activity	■ Walking briskly (3–4 mph) ■ Water aerobics ■ Bicycling (≤ 10 mph) ■ Tennis (doubles) ■ Ballroom or line dancing ■ Active play (volleyball, basketball, softball, Ping-Pong) ■ Active recreation (canoeing, hiking, rollerblading)	■ Adults should do at least 150 minutes (2 hours and 30 minutes) to 300 minutes a week of moderate-intensity, or 75 minutes to 150 minutes a week of vigorous-intensity aerobic physical activity, or an equivalent combination of moderate- and vigorous-intensity aerobic activity.	Improves overall health; helps manage body weight and prevent gradual unhealthy weight gain in adulthood
Vigorous-intensity aerobic activity	■ Racewalking, jogging, or running ■ Swimming laps, rowing ■ Tennis (singles) ■ Aerobic dancing, stair climbing ■ Bicycling (≥ 10 mph) ■ Jumping rope, hiking uphill ■ Sports (soccer, ice or field hockey, basketball) ■ Cross-country skiing	■ Additional health benefits are gained by engaging in physical activity beyond the equivalent of 300 minutes (5 hours) of moderate-intensity physical activity a week.	Helps lower blood pressure and cholesterol levels and reduce risk for heart disease, diabetes, obesity, and certain types of cancer
Muscle and bone strengthening activities	■ Push-ups, pull-ups ■ Sit-ups ■ Resistance exercises with exercise bands, weight machines, hand-held weights	20–45 minutes per session, 2–3 nonconsecutive days per week (8 or more exercises, 1–3 sets, 8–12 reps)	Maintains muscle mass; promotes strong bones; reduces symptoms of arthritis
Stretching	■ Standing or seated toe touch ■ Overhead reach ■ Yoga	Hold each positioned stretch for 20–30 seconds; do on most, preferably all, days of the week	Reduces risk for injuries and falls; increases muscle and joint flexibility

Source: Adapted from Department of Health and Human Services, *Physical Activity Guidelines for Americans*, 2nd edition. (Washington, D.C.: Department of Health and Human Services), October 2018. You can find more information about the advice on physical activity at *www.health.gov/paguidelines*.

EIGHTH **edition**

Community Nutrition in Action

Marie A. Boyle, PhD, RD

Saint Elizabeth University

CENGAGE

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Community Nutrition in Action
Eighth Edition
Marie A. Boyle

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DEDICATION

In memory of Jesse, Dylan, and Rex—my twinkling stars in the night sky. And to all those who lost loved ones to the COVID-19 pandemic—may the memories you hold dear be a blessing, and may there be time enough for healing.

—Marie A. Boyle

ABOUT THE AUTHOR

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CONTENTS IN BRIEF

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PREFACE

To succeed in community nutrition today, you must be committed to lifelong learning: every day brings new research findings, new legislation, new ideas about health promotion, and new technologies, all of which affect the ways in which community nutritionists gather information, solve problems, and reach vulnerable populations. You will probably be an entrepreneur—one who uses innovation and creativity to guide individuals and communities to optimal nutrition and good health. You will work well as a member of teams to lobby policymakers, gather information about your community, and design nutrition programs and services. You will be skilled in assessing the activities of "the competition"—the myriad messages about foods, dietary supplements, and research findings that appear in the media.

We spoke, in the first edition of this book, about a sea change—a shift toward globalization of the workforce and communications, reflected in the growth of the Internet—a virtual tsunami in communications, and a shift from clinical dietetics to community-based practice. In the last two decades, the public health arena in the United States has documented the possibilities of health care reform, the rise of complementary and integrative medicine, and the sequencing of all of the human genes—together known as the human genome.

Before the 2020 launch of *Healthy People 2030*, there had been some positive change in the number of households reporting food insecurity, but there were still significant disparities by race, ethnicity, education, and family income. However, the unprecedented rates of unemployment as a result of the COVID-19 pandemic have significantly increased food insecurity rates across the United States and around the world. Obesity, diabetes, and other chronic diseases, including heart disease, are increasingly prevalent in both developed and developing countries. Our society acknowledges that current modes of food production have contributed to some of the adverse environmental changes that we see. The concept of sustainable food systems is gaining mainstream attention—with numerous groups encouraging consumers to increase their awareness of sustainability issues and how these apply to food systems and the health of communities. The growing connectedness of the human race—through increasing use of mobile devices and social media—promises new opportunities for community nutritionists to enhance the health and well-being of all peoples.

Since the last edition was published, our society has strengthened wellness policies for its schools; proposed new policies and legislation to prevent obesity and overweight in school, workplace, and community environments; rallied behind the importance of addressing the social determinants of health, as well as the underlying racial and ethnic biases and injustices that impact population health; embraced social marketing and evidence-based guidelines for practice; and gathered evidence and data to improve public health practice and policies—in an effort to achieve the nation's health objectives during the current decade.

As this book went to press, the COVID-19 pandemic was ravaging the world as a combined economic, health, social, political, and environmental crisis. The pandemic underscored the longstanding social and economic inequalities in developed and developing countries alike, and exposed several truths that impact the work of community nutritionists, particularly in the policymaking and program planning arena: The current food system and supply chains are fragile; undernourished people have weaker immune systems and may be at greater risk of severe illness; underlying conditions, including obesity, heart disease, and diabetes worsen COVID-19 outcomes; people who experience inequities—including the poor, women and children, those living in fragile or conflict-affected areas, minorities, refugees, and the homeless—are particularly affected by the virus. In order to recover from the pandemic and better prepare for future crises, much is needed, including stable access to services essential for well-being, such as food security, education, health care, a safe environment, and expanded public health outreach, particularly for vulnerable populations. Some of the hindsight gained from the experiences of 2020 is reflected in several of the chapters in this eighth edition of the text.

This new eighth edition includes new features and some reorganization:

- The chapter—"A National Nutrition Agenda for the Public's Health" (Chapter 3) has been moved up to follow the epidemiology chapter discussion so that the incidence, distribution, and control of disease in a population, as well as the status of current nutrition recommendations versus consumer practices may be examined before trying to understand and achieve behavior change (Chapter 4). The chapter also precedes the program planning chapter (Chapter 6) to showcase the role of nutrition monitoring and research in developing an evidence base on which to build policy and programming.
- Chapter 4 "Understanding and Achieving Behavior Change" describes several evidence-based theories and strategies to consider when designing a nutrition intervention program targeting lifestyle change related to eating patterns and physical activity and includes practical applications of motivational interviewing, the transtheoretical model (stages of change), health belief model, theory of planned behavior, social-cognitive theory, and cognitive-behavioral theory. The chapter is now positioned before the community needs assessment and program planning chapters to provide students with a theoretical base for planning program activities.
- The material on working with the media is now presented in one chapter (Chapter 7) so that this important topic is as clear and concise as possible. The Professional Focus "Building Media Skills" helps students gain critical communication skills using various media platforms, including social media.
- The text's program planning chapter (Chapter 6) follows the chapter on community needs assessment in order to facilitate students' projects in program planning earlier in the semester. The program planning chapter includes more examples to help students write objectives for the program planning process, and new tools used in program evaluation, including the RE-AIM Framework for program planning and evaluation. In the case study following Chapter 6, students practice their program planning skills for designing and implementing a worksite wellness program.
- The text further illustrates the importance of demonstrating meaningful outcomes for nutrition services by including a Professional Focus following Chapter 6 that introduces the nutrition care process (NCP) to enable community nutrition professionals to compete successfully in a rapidly changing environment. Examples of applying the nutrition care process for heart disease in different community practice settings are given. Two case studies also incorporate the NCP to give students practice in writing a nutrition diagnosis as a problem, etiology, signs, and symptoms (PES) statement.

New and expanded topics include:

- Chapter 1 introduces readers to the diverse range of practice settings and opportunities available to community and public health nutritionists. The new feature—"Community-Based Nutrition Professionals"—highlights practice areas within the field of community nutrition and features the work of community nutrition professionals in each area.
- Expanded coverage of the nation's guidelines for healthy meals and snacks in schools, and inclusion of strategies to promote healthy eating and physical activity habits in schools and communities, including family-based interventions and the Smarter Lunchroom Movement.
- Inclusion of the new Code of Ethics for nutrition and dietetics practitioners, new legislative priorities relevant to community nutrition, and the current strategic plan of the Academy of Nutrition and Dietetics.
- Complete coverage of the *Dietary Guidelines for Americans*, which emphasize healthy eating patterns and other recommendations to improve the nutrition and health status of Americans.
- Inclusion of the core functions and recently updated 10 Essential Services of Public Health provides a framework for promoting the health of all communities. Several chapters include discussion of the new *Healthy People 2030* initiative and its emphasis on health disparities and the social and physical determinants of health.
- The social–ecological model, which illustrates how diverse factors converge to influence food and physical activity choices. The Centers for Disease Control and Prevention's "Social Ecological Model: A Framework for Prevention" is introduced in Chapter 1, connected to the *Dietary Guidelines for Americans* in Chapter 3, and applied to child obesity in Chapter 8.
- Expanded coverage of cultural competence and health disparities with specific examples of health disparities. Practical considerations and recommendations for providing culturally sensitive community interventions are included.
- The most recent recommendations for obesity prevention as found in the IOM report, *Accelerating Progress in Obesity Prevention: Solving the Weight of the Nation*; new coverage of proposed policies and legislation to prevent obesity and overweight in the school, workplace, and community environments; a Programs in Action feature "The Farm to Work Initiative: An Innovative Approach to Obesity Prevention" describes a worksite wellness program that was created to change the worksite environment in order to make opting for fruits and vegetables an easy choice for employees.
- The Programs in Action feature "Whole School, Whole Community, Whole Child Programs" describes a model

that views the school in a multidimensional and systems-level fashion, in which all components at the school level work together to maintain consistent, healthful messages, including the surrounding community and environment.

- Expanded discussion of nutrition-related environmental concerns and sustainability issues such as how our food and agricultural system impacts our food choices, nutrition, and environment. The new Professional Focus in Chapter 3—"Environmental Nutrition as a Public Health Issue"—introduces the environmental nutrition model, features international dietary guidelines that integrate messages about the environment and sustainability, and considers how college campuses can build connections between nutrition and the environment. The new Professional Focus in Chapter 10—"Moving Toward Community Food Security"—summarizes the characteristics of a healthy, sustainable food system and takes a closer look at recommended strategies for building community food security.
- Program planning tools including community nutrition mapping tools and the Logic Model; the Logic Model is included to provide a framework for planning, implementing, managing, and evaluating community nutrition programs.
- New infant feeding guidelines and breastfeeding promotion efforts by WIC, including efforts to improve exclusive breastfeeding rates; UNICEF's Programming for Infant and Young Child Feeding, including interventions for improved breastfeeding and complementary feeding.
- Since connecting program objectives with appropriate activities is an important program planning skill, new tips for linking objectives with program activities for achieving the objectives are included; several chapters place new emphasis on the three levels of intervention—building awareness, changing lifestyles, or creating a supportive environment—when linking objectives and activities. In the case study: "Developing a Nutrition Education Plan for Older Adults at Congregate Feeding Sites," students use literature and formative evaluation data to develop topics and objectives for nutrition lessons, and include strategies that address each of the three levels of intervention.
- In the case study following Chapter 17, students incorporate social media and social marketing tools in developing a marketing plan for a weight-loss program.
- Utilizing new Case Studies, students learn to write a personal mission statement, work in a county public health department, access consumer trends and opinions on healthy eating and sustainable food system practices, and describe the benefits and challenges of providing remote telehealth counselling. Students gain skills in designing health promotion and nutrition education programming for pregnant women, older adults, and participants in the federally funded food assistance programs. Students learn to implement the core elements of the Farm to School Program and justify to potential grant funders how a proposed project will advance the health of the employees in a healthcare system and local community.
- Many of the new full color photos throughout the text are accompanied by captions that leverage the power of storytelling to make the case that food insecurity, the obesity epidemic and other pressing public health issues are challenges facing all communities; that critical investments are needed in the federal nutrition assistance programs and in healthcare; and that grassroots solutions exist to alleviate the effects of poverty, health disparities, and chronic diseases. Images are used to convey the message that improved population health is possible by harnessing the skillset and creativity of community and public health nutritionists in the many community nutrition practice settings across this nation and around the world.

Several terms surface repeatedly in this text: *change, innovation, creativity, evidence-based, community, policymaking, networking, social determinants of health, sustainability, and entrepreneurship*. These watchwords herald the unprecedented challenges that lie ahead of us in this decade. Community nutritionists who succeed in this challenging environment are flexible, innovative, and versatile. They are *focused* on recognizing opportunities for improving people's nutrition status and health and on helping society meet its obligation to alleviate food insecurity and malnutrition. It is an exciting time for community nutritionists. It is a time for learning new skills and moving into new areas of practice. It is a time of great opportunity and incredible need.

The Eighth Edition

In this eighth edition, we continue to discuss the important issues in community nutrition practice and to present the core information needed by students who are interested in solving nutrition and health problems. The book is organized into three sections. Section One shows the community nutritionist in action within the community. Chapter 1 describes the activities and responsibilities of the community nutritionist and introduces the essential services of public health, the social determinants of health, and the three arenas of community nutrition practice: people, policy, and programs. Chapter 2 reviews the basic principles of epidemiology. Chapter 3 focuses on the nuts and bolts of national nutrition policy, including national nutrition monitoring and dietary recommendations, and includes coverage of environmental nutrition issues. Chapter 4 introduces several behavior change theories and discusses what research tells us about how to influence

behavior. Chapter 5 gives a step-by-step analysis of the community needs assessment process and describes the types and sources of data collected about the community, as well as the questions you'll ask in obtaining information about your target population, including diet assessment methods. Chapter 6 describes the program planning process, covering everything from the factors that trigger program planning, to tools such as the RE-AIM Framework and the Logic Model to guide the planning process, to the types of evaluations undertaken to improve program design and delivery. Chapter 7 makes it perfectly clear that if you're a community nutritionist, you're involved in policymaking. Chapter 8 discusses the epidemic of obesity, examining some societal and environmental determinants of the epidemic, current public health policies, and proposed policies and legislation to prevent obesity and overweight. Chapter 9 discusses today's health care system, health care reform, and the challenge of eliminating health disparities and providing quality health care to all citizens, and the necessity of outcomes assessment in nutrition services.

Section Two describes current federal and non-governmental programs designed to meet the food and nutritional needs of vulnerable populations. Chapter 10 examines some of the issues surrounding poverty and food insecurity in the domestic arena, considers how these contribute to nutritional risk and malnutrition, and outlines the major domestic food and nutrition assistance programs designed to help with achieving food security. Chapter 11 focuses on programs for pregnant and lactating women and for infants. Chapter 12 describes programs for children and adolescents. Chapter 13 covers a host of programs for adults, including older adults. Chapter 14 examines the issue of global food insecurity.

Section Three focuses on the tools used by community nutritionists to address nutritional and health problems in their communities. Chapter 15 addresses the need for cultural competence and explains strategies for providing culturally competent nutrition services. Chapter 16 gets to the heart of any program: the nutrition messages used in community interventions. Chapter 17 introduces the principles of marketing, including social marketing, an important endeavor in community nutrition practice. You are more likely to get good results if your program is marketed successfully! Chapter 18 addresses such important management issues as how to control costs and manage people. Finally, Chapter 19 closes the text with a discussion of grantsmanship—everything you need to know about finding and managing funding for community programs and interventions.

Many of the unique features of the previous editions have been retained:

- **Professional Focus.** This feature is designed to help you develop personal and professional skills and attitudes that will boost your effectiveness and confidence in community settings. The topics range from practice areas within the field of community nutrition, community food security, environmental nutrition as a public health issue, utilizing the Academy of Nutrition and Dietetic's nutrition care process in community settings, goal setting, and time management to public speaking, working with the media, including social media, and leadership.
- **Programs in Action.** This feature—found in most chapters—highlights award-winning, innovative, grassroots nutrition programs. It offers a unique perspective on the practice of community nutrition. Our hope is that the insights you gain from these initiatives will inspire you to get involved in learning about your community and its health and nutritional problems and to design similar programs to address the needs you uncover. The feature highlights such programs as Eat Healthy: Your Kids Are Watching, a program designed to remind parents that they serve as role models for their children; the Farm to Work Initiative, an innovative approach to obesity prevention; the Food Literacy Partners Program, a "learn-and-serve" program that provides nutrition education to volunteers in exchange for community nutrition education service; and Food on the Run, a program to empower teens to make healthful decisions about their nutrition and physical activity patterns. This feature discusses each program's goals, objectives, and rationale; the practical aspects of its implementation; and its effectiveness in serving the needs of its intended audience.
- **Case Studies.** The book's case studies make use of a transdisciplinary, developmental problem-solving model as a learning framework to enhance students' critical thinking skills.* They are designed to help students develop competence in applying their knowledge and skills to contemporary nutrition issues with real-life uncertainties—such issues as might be found in the workplace. Each case emphasizes the need to evaluate the information presented, identify and describe uncertainties in the case, locate and distinguish between relevant and irrelevant information, identify assumptions, prioritize alternatives, make decisions, and communicate and evaluate conclusions. Many of the case questions are open-ended.
- **Think Like a Community Nutritionist.** This feature—found in most chapters—provides questions and activities

* See C. L. Lynch, S. K. Wolcott, and G. E. Huber, *Steps for Better Thinking: A Developmental Problem Solving Process*, May 31, 2002; available at *www.WolcottLynch.com*.

to help you think analytically and critically about the chapter topics, giving you the opportunity to step into the role of a community nutritionist to further explore scenarios that you may encounter in the field.
- **Chapter Summaries.** Each chapter presents the major points in a concise, section-by-section bulleted list. The design enables students to easily identify content that requires further review and locate where the information is located in the chapter.
- **Internet Resources.** Each chapter ends with a list of relevant Internet addresses. You'll use these websites to obtain data about your community and to scout for ideas and educational materials. Moreover, you can link with the Internet addresses presented in this book through the publisher's website at *www.cengagebrain.com*.

Finally, we hope that the people, policies, and programs presented in this text inspire you to consider a rewarding career path in community nutrition. We want you to think of yourself as a planner, manager, change agent, thinker, and leader—in short, a nutrition entrepreneur—who has the energy and creativity to open up new vistas for improving the public's health through good nutrition.

Instructor and Student Resources

Additional instructor resources for this product are available online. Instructor assets include an Instructor's Manual, Educator's Guide, PowerPoint® slides, and a test bank powered by Cognero®. Sign up or sign in at www.cengage.com to search for and access this product and its online resources.

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Marie Boyle
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Community Nutritionists in Action:

Working in the Community

On Saturday morning, Irene H. opens her kitchen cabinet and takes down six small bottles. She lines them up on the countertop and works their caps off. The process takes a few minutes because her fingers are stiff from arthritis. Let's see, there's cod liver oil, chondroitin sulfate, and glucosamine for arthritis; ginkgo biloba and St. John's wort to relieve anxiety and depression; and DHEA to restore youthful vigor. Irene knows her primary care doctor would be surprised—maybe shocked—to learn that she takes these supplements regularly. She knows, too, that she still needs to inform her doctor of the alternative health approaches she has been trying, including her consultations with a naturopath whose office is just a couple of miles from her home.

At age 48, Irene figures she is doing all she can to manage the pain from her arthritis and the depression that has afflicted her since her divorce. The supplements and naturopathic counseling are expensive, but she stretches the income from her job as a checkout clerk at a paint supply store to pay for them. After washing down the pills with orange juice, Irene pops two frozen waffles in the toaster and pours another cup of coffee. She figures she shouldn't eat the waffles—she was diagnosed with type 2 diabetes just three months ago—but she wants them. After breakfast, she'll enjoy a cigarette with her coffee and then call her oldest daughter. Maybe they can drive out to the mall.

Irene is a typical consumer in many respects. She has chronic health problems for which she has sought conventional medical advice and treatment. Like one in three U.S. adults, she has also sought help from an alternative practitioner. Irene smokes cigarettes, she is overweight, and about the only exercise she gets is browsing the sales racks at the mall. She could do more to improve her health, but she isn't motivated to change her diet or quit smoking. Irene is looking for the quick fix.

Irene and the thousands of other consumers like her are a challenge for the community nutritionist. To help Irene make changes in her lifestyle—changes that will reduce her demands on the health-care system and improve her physical well-being—the community nutritionist must be familiar with a broad spectrum of clinical and epidemiologic research, understand the health-care system, and draw on the principles of public health and health promotion. The community nutritionist must know where Irene and people like her live and work, what they eat, and what their attitudes and values are. The community nutritionist must know about the community itself and how it delivers health services to people like Irene. And the community nutritionist must know how to influence policymakers. Perhaps now is the time to call for tighter regulation of dietary supplements and greater government support for health promotion and disease prevention programs.

This section describes the work that community nutritionists do in their communities. It outlines the principles of public health, health promotion, and policymaking and reviews the current health-care environment. You will learn strategies to influence—and eventually change—the behavior of a target population. The incorporation of behavior change theories in program planning is critical to the nutrition care process because the theories suggest the questions that community nutritionists should ask to understand why consumers do what they do. This section also outlines some of the tools you might use to assess the nutrition status of a target population and describes how to conduct a needs assessment in your community. You'll learn how to lay out a plan for designing a program or intervention and how to write program goals and objectives.

This section describes how to use the results of a community needs assessment by reviewing several important questions: *Who* has a nutritional problem that is not being met? *How* did this problem develop? *What* programs and services exist to alleviate this problem? *Why* do existing services fail to help the people who experience this problem? The answers to these and other questions help community nutritionists understand the many factors that influence the health and nutrition status of a particular group.

The section also introduces entrepreneurship—the discipline founded on creativity and innovation—and how entrepreneurial principles can be used to reach Irene and other people in the community with health and nutritional problems. The material in this section sets the stage and lays the groundwork for understanding what community nutritionists do: focus on people, policies, and programs.

SECTION 1

CHAPTER 1

Opportunities in Community Nutrition

LEARNING **OBJECTIVES**

After you have read and studied this chapter, you will be able to:

1.1 Describe the three arenas of community nutrition practice.

1.2 Explain how community nutrition practice fits into the larger realm of public health.

1.3 Describe the three types of prevention efforts and identify an example of each.

1.4 List three major health objectives for the nation and explain why each is important.

1.5 Outline the educational requirements, practice settings, and roles and responsibilities of community and public health nutritionists.

THIS CHAPTER ADDRESSES such issues as health promotion, emerging social, economic, and cultural trends, public policy development, and the roles of others with whom the registered dietitian nutritionist collaborates in the delivery of food and nutrition services in various practice settings, which have been designated by the Accreditation Council for Education in Nutrition and Dietetics (ACEND) as Core Knowledge and Learning Outcomes for dietetics education.

Something to think about…

"Education and health are the two great keys. We must use all public sector institutions, flawed though they may be, to close the gap between rich and poor. We must work with the political sector to convincingly paint the breadth and depth of the problem and the size of the opportunity as well. … Above all, we must not abandon the hope of progress."

—SIR GUSTAV NOSSAL, writing on health and the biotechnology revolution in Public Health Reports, *March/April 1998*

Introduction

Community nutritionists face many challenges today. There is the challenge of improving the nutrition status of diverse groups of people with different education and income levels and different health and nutritional needs: teenagers with anorexia nervosa, pregnant women living in public housing, the homeless, new immigrants from Southeast Asia, older adult women alone at home, middle-class adults with high blood cholesterol, professional athletes, and children with disabilities. There is the challenge of forming partnerships with colleagues, business leaders, and the public to advocate for change. There is the challenge of influencing lawmakers and other key citizens to enact laws, regulations, and policies that protect and improve the public's health. There is the challenge of studying the scientific literature for new strategies to promote healthy eating throughout communities across the globe. There is the challenge of connecting food choice with sustainability of the food system and planetary health. And there is the challenge of mastering new media and technologies to help meet the needs of clients and communities.

In addition to these challenges, certain social and economic trends also present challenges for community nutritionists. Communities sometimes struggle to provide access to quality, affordable, and culturally competent health care to people and communities who experience barriers to community and health-care services.[1*] The North American population is aging rapidly as Baby Boomers age into later life and life expectancy increases.[2] Financial pressures and increased global competition have forced governments, businesses, and organizations to be creative in the face of scarce resources. Indeed, according to one survey of employers undertaken by the Academy of Nutrition and Dietetics, the single greatest challenge for the food and nutrition professional today is "the need to do more and better with less."[3] Community nutritionists in all practice settings face rising costs, changing consumer expectations about health-care services, increased competition in the market, and greater cultural diversity among their clients. They are pressured by downsizing, mergers, cross-training, and technological advances.

Community nutritionists who succeed in this changing environment are flexible, innovative, and versatile. They are *focused* on recognizing opportunities for improving people's nutrition status and health and on helping society meet its obligation to alleviate hunger and malnutrition. It is an exciting time for community nutritionists. It is a time for learning new skills and moving into new areas of practice. It is a time of great opportunity and incredible need.

The Concept of Community

"There is no complete agreement as to the nature of community," wrote G. A. Hillery, Jr.[4] Such diverse locales as isolated rural hamlets, mountain villages, prairie towns, state capitals, industrial cities, suburbs or ring cities, resort towns, and major metropolitan areas can all be lumped into a single category called "community."[5] The concept of community is not always circumscribed by a city limits sign or zoning laws. Sometimes the term describes people who share certain interests, beliefs, or values, even though they live in diverse geographical locations; examples include the academic community, the LGBTQ+ community, and the immigrant community. For our purposes in this book, a **community** is a grouping of people who reside in a specific locality and who interact and connect through a definite social structure to fulfill a wide range of daily needs. By this definition,

Community A group of people who are located in a particular space (including cyberspace), have shared values, and interact within a social system.

*Reference notes for each chapter are in the MindTap Reader within your MindTap course and in the Instructor Companion site.

a community has four components: people, a location in space (which can include the realm of cyberspace), social interaction, and shared values.

Communities can be viewed on different scales: global, national, regional, and local. Each of these can be further segmented into specialized communities or groups, such as those individuals who speak Spanish, those who have gym memberships, and those who observe Hanukkah. In the health arena, communities tend to be segmented around particular wellness, disease, or risk factors—for example, adults who exercise regularly, infants with fetal alcohol syndrome, men with high blood pressure, and children with a peanut allergy.

Opportunities in Community Nutrition

Community nutrition A discipline that strives to prevent disease and to improve the health, nutrition, and well-being of individuals and groups within communities.

Founded on the sciences of epidemiology, food, nutrition, and human behavior, **community nutrition** is a discipline that strives to improve the health, nutrition, and well-being of individuals and groups within communities. Its practitioners develop policies and programs that help people improve their eating patterns and health. Indeed, these three arenas—people, policy, and programs—are the focus of community nutrition. As an example, low-income pregnant women benefit from nutrition counseling, nutritious foods, and breastfeeding support provided by the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), which is supported by federal policy that authorizes a specific amount of funds each year for the program.

People

Individuals who benefit from community nutrition programs and services range from young single mothers on public assistance to senior business executives, from immigrants learning English for the first time to college graduates, from pregnant teenagers with iron-deficiency anemia to grandfathers with Alzheimer's disease. They are found in worksites, schools, community centers, health clinics, churches, apartment buildings—virtually any community setting. Through community nutrition programs and services, these individuals and their families have access to food in times of need

Community nutrition is a discipline that strives to prevent disease and improve the nutrition and health status of individuals and groups within communities. Three arenas—people, policy, and programs—are the focus of community nutrition.

U.S. Department of Health and Human Services

or learn skills that improve their eating patterns. It is the community nutritionist who identifies a group of people with an unmet nutritional need; gathers information about the group's socioeconomic background, ethnicity, religion, geographical location, and cultural food patterns; and then develops a program or service tailored to the needs of this group.

Policy

Policy is a key component of community nutrition practice. **Policy** is a course of action chosen by public authorities to address a given problem.[6] Policy is what governments and organizations intend to accomplish through their laws, regulations, and programs.

Policy A course of action chosen by public authorities to address a given problem.

How does policy apply to the practice of community nutrition? Consider a situation in which a group of community nutritionists address food waste in their community. The impetus for their action came from learning the results of a U.S. Department of Agriculture study that found that 30% to 40% of all food produced in the United States is wasted[7] and from reading about the U.S. Environmental Protection Agency's (EPA) Food Recovery Hierarchy, which ranks feeding hungry people near the top of its strategies for reducing wasted food (see Chapter 3 for more details). *Gleaning* was a suggested method to deliver an abundance of apples from communities with apple orchards to food banks in neighboring states where apples were scarce.[8] The community nutritionists wanted to try gleaning on a small scale, using farmers' markets in their community. Unfortunately, there was no city bylaw that allowed surplus foods from farmers' markets to be made available to local food banks and soup kitchens. After gaining the support of the farmers' markets, food banks, and soup kitchens, the community nutritionists lobbied the city council to enact a bylaw to allow such transactions. The city council members voted to pass a bylaw to support gleaning projects. In other words, the city council altered its *policy* about recovering and recycling surplus foods.

Community nutritionists are involved in policy when they e-mail their state legislators or connect with them on social media, lobby Congress to secure expanded Medicare coverage for medical nutrition therapy, advise their municipal governments about food banks and soup kitchens, and use the results of research to influence policymakers. Many aspects of the community nutritionist's job involve policy issues.

Programs

Programs are the instruments used by community nutritionists to seek behavior changes that improve nutrition status and health. They are wide-ranging and varied. They may target small groups of people—children with developmental disabilities in Nevada schools or teenagers living in a Brooklyn residential home—or they may target large groups, such as all adults with high blood cholesterol concentrations. Programs may be as widespread as the U.S. federal Supplemental Nutrition Assistance Program (SNAP; formerly called the Food Stamp Program), or as local as a diabetes prevention program for Mohawk people living in the Akwesasne community in northern New York State. They may be tailored to address the specific health and nutritional needs of people with obesity or osteoporosis, or they may be aimed at the general population. Two examples of population-based programs are "We Can," a national program designed to give parents, caregivers, and entire communities a way to help children ages 8–13 stay at a healthy weight, and "Have a Plant," a program of the Produce for Better Health Foundation and its partners aimed at making people, particularly Millennials and Gen Z, more aware of how eating fruits and vegetables can improve their health and may reduce their risk of cancer and other diseases. Regardless of the setting or target audience, community nutrition programs have one desired outcome: behavior change.

Public Health and Community Interventions

Community nutritionists promote good nutrition as one avenue for achieving good health. They develop programs to help people improve their eating habits, and they seek environmental changes (in the form of policy) to support good health habits. But community nutritionists do not work in a vacuum. They work closely with other practitioners, particularly those in public health, to help consumers achieve and maintain behavior change.

Public health Promotes and protects people's health and the communities where they live, learn, work, and play.

Public health can be defined as an effort organized by society to protect, promote, and restore the people's health through the application of science, practical skills, and collective actions. **Figure 1-1** illustrates the entities making up a public health system. "Public health is what we, as a society, do collectively to assure the conditions in which people can be healthy," wrote the authors of a report for the Institute of Medicine.[9] In the 19th century, the scope of public health was generally restricted to matters of general sanitation, including building municipal sewer systems, purifying the water supply, and controlling food adulteration. Major public health efforts focused on controlling infectious diseases such as tuberculosis, smallpox, yellow fever, cholera, and typhoid. In 1900, the leading causes of death and disability in the United States were pneumonia, tuberculosis, and diarrhea/enteritis. The morbidity and mortality linked with these disease outbreaks shaped public health practice for many years. Until the **COVID-19 pandemic** of 2020, such runaway disease outbreaks were relatively uncommon because of large-scale public efforts to improve water quality, control the spread of communicable diseases, and enhance personal hygiene and the sanitation of the environment. **Figure 1-2** outlines the core functions and 10 essential services of public health.

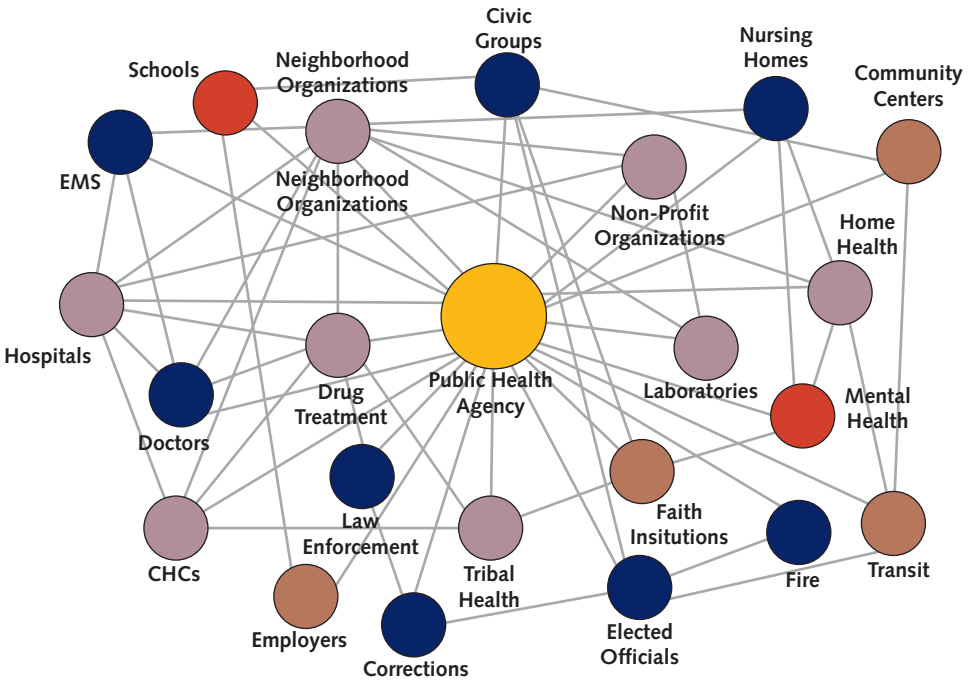
COVID-19 pandemic In humans, several coronaviruses are known to cause respiratory infections ranging from the common cold to more severe diseases such as Middle East respiratory syndrome (MERS) and severe acute respiratory syndrome (SARS). The most recently discovered coronavirus was coronavirus disease 2019 (COVID-19). On March 11, 2020, the World Health Organization declared COVID-19 a pandemic (a global outbreak of disease) due to the number of individuals and countries affected.

The leading causes of morbidity and mortality in the United States are chronic diseases such as heart disease, cancer, and chronic lung disease (**Figure 1-3**). Cardiovascular disease (mainly heart disease and stroke) causes about 31% of all deaths worldwide, killing 648,000 U.S. adults and 17.9 million people worldwide every year.[10] Cancer kills almost 599,000 people each year in the United States and about 9.6 million people worldwide.[11] Other serious chronic diseases that reduce the quality of life, disable, or kill include arthritis, diabetes mellitus, osteoporosis, and Alzheimer disease.[12]

The Purpose of Public Health: Prevent epidemics and spread of disease; protect against environmental hazards; prevent injuries; promote and encourage healthy behaviors; respond to disasters and assist communities in recovery; and ensure the quality and accessibility of services.

Public Health Image Library

FIGURE 1-1 Public Health Systems



Public health systems are commonly defined as "all public, private, and voluntary entities that contribute to the delivery of essential public health services within a jurisdiction." The public health system includes:

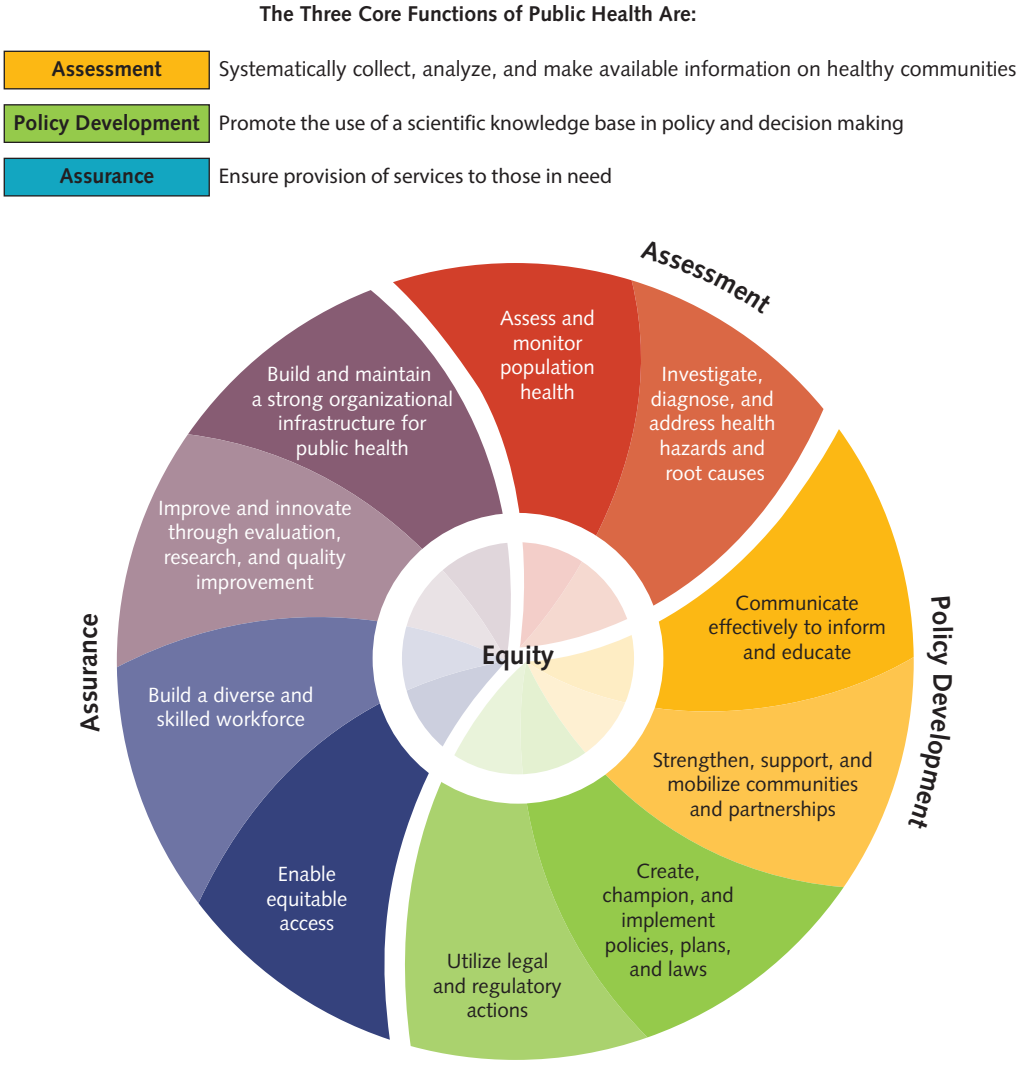
- Public health agencies at state and local levels
- Health-care providers
- Public safety agencies
- Human service and charity organizations
- Education and youth development organizations
- Recreation and arts-related organizations
- Economic and philanthropic organizations
- Environmental agencies and organizations

Source: Public Health Practice Program Office, Centers for Disease Control and Prevention, National Public Health Performance Standards Program, User Guide, 2002. [EMS = Emergency Medical Services, CHCs = Community Health Centers]

Many of the major killers—such as heart disease, some types of cancer, chronic lung disease, stroke, and diabetes—are influenced by a number of factors, including a person's genetic makeup, eating and physical activity habits, exposure to tobacco, and other lifestyle practices (see **Figure 1-4**).[13] Five of the 15 leading causes of death in the United States—heart disease, cancer, stroke, diabetes, and hypertension—have been linked to diet. Another three are associated with excessive alcohol consumption: accidents, suicide, and liver disease.[14] Because obesity and a sedentary lifestyle are linked with chronic diseases, such as diabetes, heart disease, and certain cancers, it can be projected that increased rates of obesity will lead to increased deaths each year, not to mention hospitalizations, disability, time lost from jobs, and poor quality of life for many Americans.[15]

Chronic diseases cause increasing numbers of deaths worldwide as well.[16] Chronic diseases were responsible for 68% (38 million) of all deaths globally in 2017, up from 60% (31 million) in 2000.[17] The four main types of chronic diseases worldwide are cardiovascular diseases (heart attacks and stroke), cancers, chronic lung diseases, and diabetes (see Figure 1-3).[18]

FIGURE 1-2 The Core Functions and Essential Services of Public Health



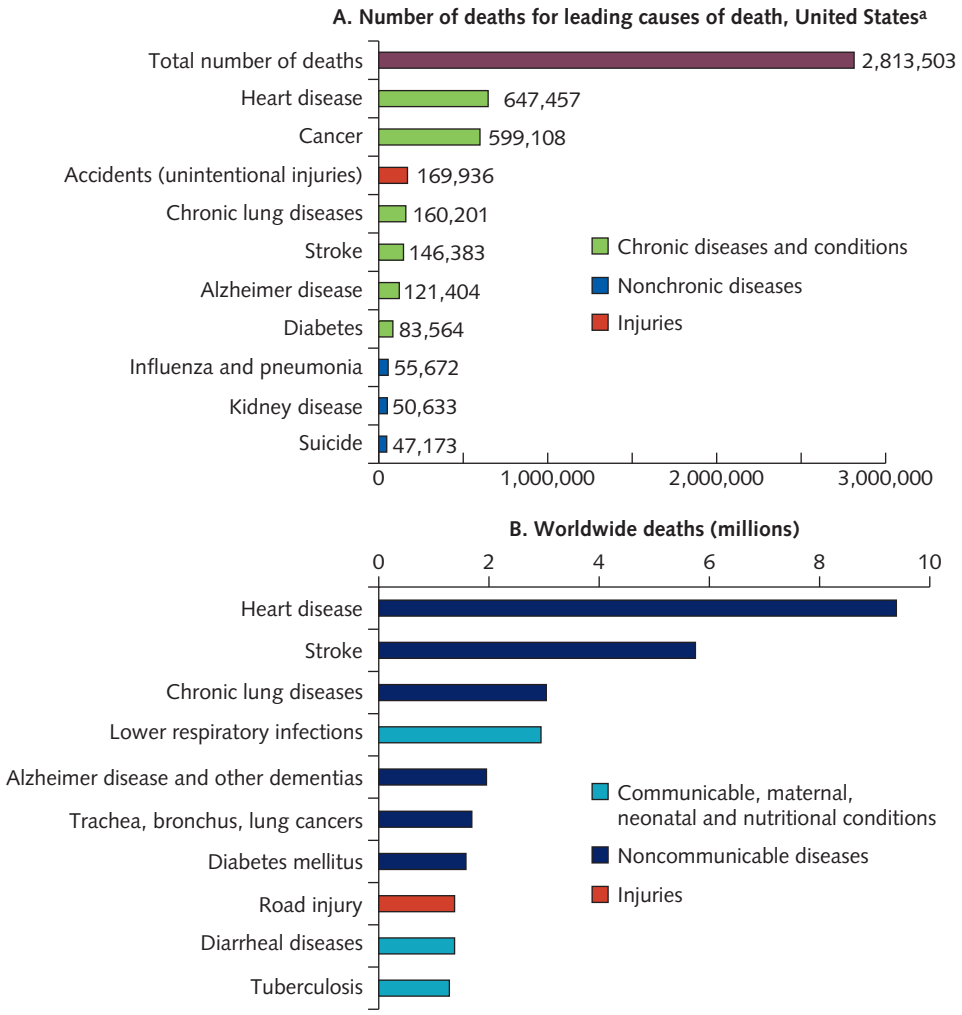
The 10 Essential Public Health Services provide a framework for public health to protect and promote the health of all people in all communities:

1. Assess and monitor population health status, factors that influence health, and community needs and assets
2. Investigate, diagnose, and address health problems and hazards affecting the population
3. Communicate effectively to inform and educate people about health, factors that influence it, and how to improve it
4. Strengthen, support, and mobilize communities and partnerships to improve health
5. Create, champion, and implement policies, plans, and laws that impact health
6. Utilize legal and regulatory actions designed to improve and protect the public's health
7. Assure an effective system that enables equitable access to the individual services and care needed to be healthy
8. Build and support a diverse and skilled public health workforce
9. Improve and innovate public health functions through ongoing evaluation, research, and continuous quality improvement

Source: 10 Essential Public Health Services Futures Initiative Task Force. 10 Essential Public Health Services. September 9, 2020. https://phnci.org/uploads/resource-files/EPHS-English.pdf.

These changes in disease patterns over the last few decades have spawned changes in public health actions. Because the goals of public health reflect the values and beliefs of society and existing knowledge about disease and health, public health initiatives change as society's perception of health needs changes. In order to ensure the health of the public in the 21st century, public health initiatives have shifted from financing basic

FIGURE 1-3 Leading Causes of Death, United States and Worldwide, 2017



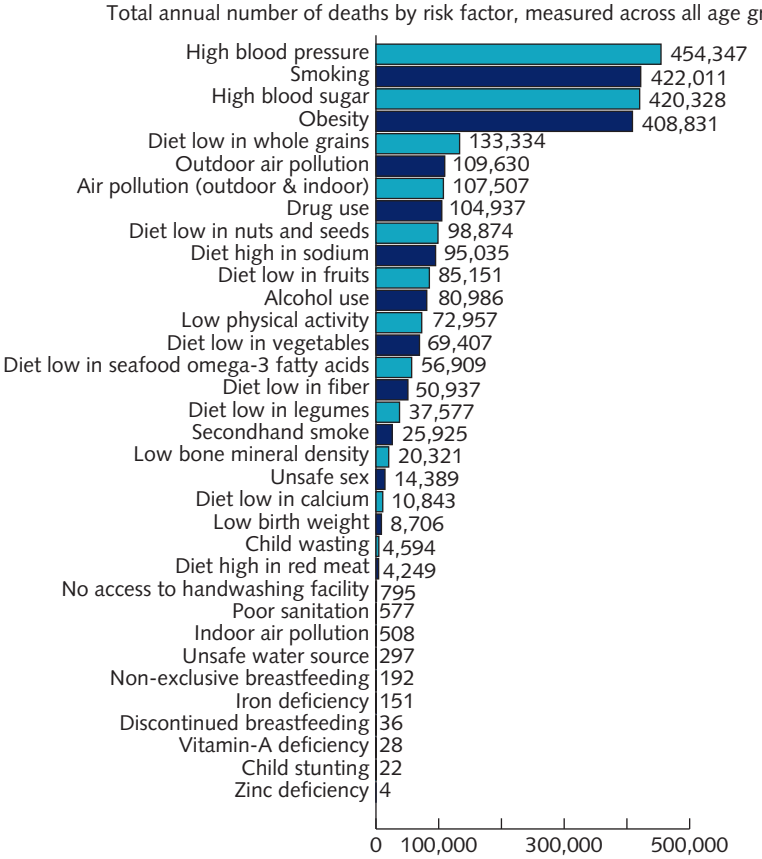
A. Many of the major chronic disease killers—such as heart disease, some types of cancer, stroke, and diabetes—are influenced by a number of factors, including a person's genetic makeup, eating habits, physical activity, and other lifestyle habits.

B. More than half (54%) of the deaths worldwide are due to the top 10 causes. Heart disease and stroke have remained the leading causes of death globally for the last 15 years, accounting for a combined 15.2 million deaths in 2016. Chronic lung disease claimed 3.0 million lives in 2016, while lung cancer (along with trachea and bronchus cancers) caused 1.7 million deaths. Diabetes killed 1.6 million people in 2016, up from less than 1 million in 2000. Deaths due to dementias more than doubled between 2000 and 2016, making it the 5th leading cause of global deaths in 2016. Lower respiratory infections remained the deadliest communicable disease, causing 3.0 million deaths worldwide in 2016.

[a]The leading cause of death for persons age 15–24 in the United States is motor vehicle and other accidents, followed by homicide, suicide, cancer, and heart disease. About half of all accident fatalities are alcohol related.

Sources: Centers for Disease Control and Prevention, *National Vital Statistics Report, 2018*; available at *www.cdc.gov/nchs*; World Health Organization, *The Top Ten Causes of Death* (Geneva: World Health Organization, 2018).

FIGURE 1-4 Number of Deaths by Risk Factor, United States, 2017



This figure shows the numbers of deaths attributed to several specific risk factors, including diet and lifestyle-related factors (blood pressure, physical activity, body mass index, blood sugar, and eating patterns); smoking; air pollution (both outdoor and indoor); and environmental factors including clean water and sanitation. For most high-income countries, the dominant risk factors are those related to eating patterns, smoking, and alcohol intake. Other risk factors such as clean water, sanitation, and child wasting or stunting are very low. In low-income countries, the inverse is true: In Sierra Leone, for example, the top risk factors include child wasting, household air pollution, lack of safe water and sanitation, and the lack of access to handwashing facilities.

Source: Institute for Health Metrics and Evaluation, *Global Burden of Disease*, 2018; H. Ritchie, Causes of Death, Published online at OurWorldInData.org.

population-based measures, such as immunization, to efforts focused on achieving universal health services, the need to respond more rapidly to new infectious diseases such as Ebola or COVID-19, and responding to new threats from antibiotic-resistant germs or **bioterrorism**.

Bioterrorism The intentional release of disease-causing toxins, microorganisms, or other substances.

Recognizing the need for increased emphasis on preventive health measures, new efforts are underway to foster better collaboration between public health agencies and other organizations involved in protecting and promoting the public's health.[19] Under the leadership of the World Health Organization (WHO), more than 190 countries have agreed upon global mechanisms to reduce the avoidable chronic disease burden.[20] This plan aims to reduce the number of premature deaths from chronic diseases by 25% by 2025 through nine voluntary global targets (**Table 1-1**). The nine targets address factors such as

TABLE 1-1 Nine Voluntary Global Targets for Prevention and Control of Chronic Diseases to be Attained by 2025

Many governments worldwide have endorsed nine specific targets with the goal to reduce premature death from the four major chronic diseases (cardiovascular diseases, cancer, diabetes, and chronic respiratory diseases) by 25% by 2025. Guidance on achieving the targets is available in the *WHO Global Status Report on Chronic Diseases*, available at: www.who.int/nmh/publications/ncd-status-report-2014/en/.

	Target 1: A 25% relative reduction in the overall mortality from cardiovascular diseases, cancer, diabetes, or chronic respiratory diseases
	Target 2: At least 10% relative reduction in the harmful use of alcohol
	Target 3: A 10% relative reduction in prevalence of insufficient physical activity
	Target 4: A 30% relative reduction in mean population intake of salt/sodium
	Target 5: A 30% relative reduction in prevalence of current tobacco use
	Target 6: A 25% relative reduction in the prevalence of high blood pressure
	Target 7: Halt the rise in diabetes and obesity
	Target 8: At least 50% of eligible people receive drug therapy and counseling to prevent heart attack and stroke
	Target 9: An 80% availability of the affordable basic technologies and essential medicines, including generics, required to treat major chronic diseases in both public and private facilities

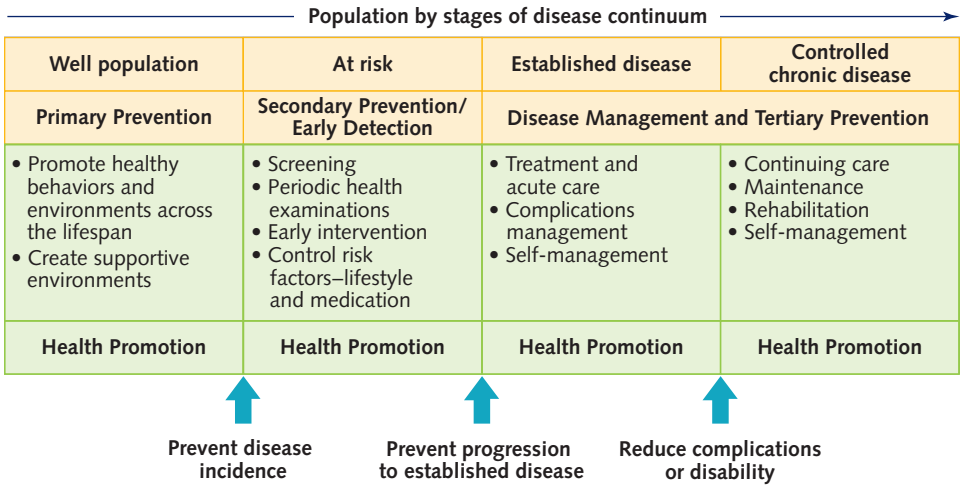
Source: WHO, Global Status Report on Noncommunicable Diseases, 2014.

tobacco and alcohol use, unhealthy diet, and physical inactivity that increase people's risk of developing chronic diseases.[21]

The Concept of Health

Most of us equate health with "feeling good," a concept we understand intuitively but cannot define exactly. The term *health* is a derivative of the old English word for "hale," which means whole, hearty, sound of mind and body.[22] Health can be viewed as a continuum along which the total living experience can be placed, with the presence of disease, impairment, or disability at one end of the spectrum and freedom from disease or injury at the other. These extremes in the health continuum are shown in **Figure 1-5**.[23]

FIGURE 1-5 The Health Continuum and Types of Prevention to Promote Health and Prevent Disease



Source: Adapted from National Public Health Partnership, *Preventing Chronic Disease: A Strategic Framework Background Paper* (National Public Health Partnership: Melbourne, Australia), 2001, 6.

Ecology The interrelations between individuals and their environments.

Health According to the World Health Organization, a state of complete physical, mental, and social well-being, not merely the absence of disease.

Social determinants of health The conditions in the environments in which people are born, live, learn, work, play, worship, and age that affect a wide range of health, functioning, and quality-of-life outcomes and risks. The range of personal, social, economic, and environmental factors that influence health status. It is the interrelationships among these factors that determine individual and population health.

Health is properly defined from an ecological viewpoint—that is, one that focuses on **ecology**, or the interaction of humans among themselves and with their environment. In this sense, **health** is a state characterized by "anatomic integrity; ability to perform personally valued family, work, and community roles; ability to deal with physical, biological, and social stress; a feeling of well-being; and freedom from the risk of disease and untimely death."[24] A healthy individual, then, has the physical, mental, and spiritual capacity to live, work, and interact joyfully with other human beings.

But how is good health achieved? Why does one child in a family become addicted to cocaine, whereas another never touches illicit drugs? Why do people start smoking? Why do some people overeat? Why do some teenagers consume adequate amounts of iron and calcium, whereas others do not? Why is one 90-year-old healthy and vigorous and another 70-year-old infirm? The answers to these questions still elude epidemiologists and other scientists. We know that a constellation of factors, shown in **Figure 1-6**, influence health. Certain individual factors such as age, sex, and race are fixed, inherited traits that influence an individual's health potential. Other factors—the **social determinants of health**—such as access to healthy foods and health-care services, education, housing, working and neighborhood conditions, social networks, and even national health policies represent layers of influence that can theoretically be changed to improve the health of individuals. In truth, however, less is known about the specific social determinants of health than about the factors that contribute to disease, injury, and disability. And understanding the causes of disease and ill health does not necessarily lead to an understanding of the causes of good health.

Health Promotion

Some people do things that are not good for their health. They overeat, smoke, refuse to wear a helmet when riding a bicycle, never wear seat belts when driving, fail to take their blood pressure medication—the list is endless. These behaviors reflect personal choices, habits, and customs that are influenced and modified by social forces. Such "lifestyle behaviors" can be changed if the individual is so motivated. Educating people about healthful and unhealthful behaviors is one way to help them adopt positive health behaviors.

think like a

COMMUNITY **NUTRITIONIST**

Community nutritionists use tailored strategies to affect each of the levels of prevention. For instance, consider the following examples related to prevention of heart disease.

- Primary prevention: A school-based program promoting fruit and vegetable consumption among children that aims to help establish heart-healthy eating habits in early life.
- Secondary prevention: A workplace-based wellness fair that provides free cholesterol screenings.
- Tertiary prevention: A clinic-based nutrition education program for patients with established cardiovascular disease that aims to reduce the risk of cardiac events.

Now it's your turn. List a primary, secondary, and tertiary prevention strategy related to cancer risk.

AP Images/Chris Pizzello

A cooking demonstration is an intervention that promotes awareness of the importance of healthful eating and teaches heart-healthy cooking skills. In this example, a chef gives a cooking demonstration to students during an event for The Teaching Garden—a program that uses gardens to teach children about healthy eating.

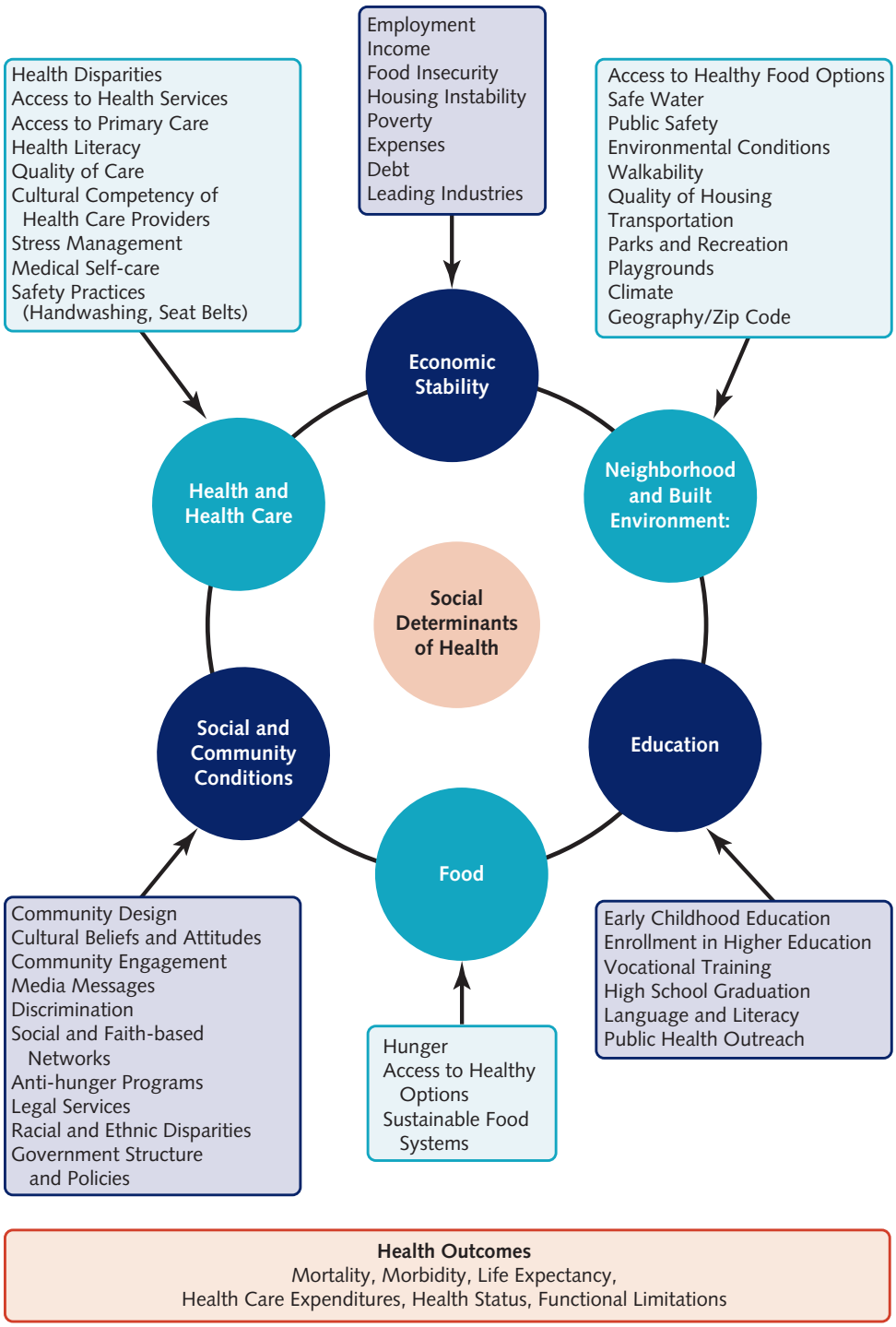


FIGURE 1-6
Understanding the Social Determinants of Health

The Social determinants of health are the conditions in the environments in which people are born, live, learn, work, play, worship, and age that affect a wide range of health, functioning, and quality-of-life outcomes and risks. Resources that enhance quality of life can have a significant influence on population health outcomes. Examples of these resources include safe and affordable housing, access to education and job training, public safety, availability of healthy foods, local emergency/health services, and environments free of life-threatening toxins. *Healthy People 2030* highlights the importance of addressing the social determinants of health by including "*Create social, physical, and economic environments that promote attaining full potential for health and well-being for all*" as one of the overarching goals for the current decade.

Source: *Healthy People 2020*: An Opportunity to Address the Social Determinants of Health in the United States; Healthy People 2030 Framework.

Health promotion The process of enabling people to achieve their maximum potential for good health.

Intervention A health promotion activity aimed at changing the behavior of a target audience.

Risk factors Factors associated with an increased probability of acquiring a disease.

Health promotion focuses on changing human behavior by encouraging people to eat healthful diets, be active, get regular rest, develop leisure-time hobbies for relaxation, strengthen social networks with family and friends, and achieve a balance among family, work, and play.[25] It is "the science and art of helping people change their lifestyle to move toward a state of optimal health."[26] Behavior change is the desired outcome of a health promotion activity—what we call an **intervention**—aimed at a target audience. Interventions focus on promoting health and preventing disease and are designed to change a preexisting condition related to the target audience's behavior.[27]

There are three types of prevention efforts, as shown in Figure 1-5. Primary prevention is aimed at preventing disease by controlling **risk factors** that are related to injury or disease. Heart-healthy cooking classes, for example, help people change their eating and cooking patterns to reduce their risk of cardiovascular disease. Secondary prevention focuses on detecting disease early through screening and other forms of risk appraisal. Public screenings for hypertension at a health fair identify people whose blood pressure is high; these individuals are then referred to a physician or other health professional for follow-up and treatment. Tertiary prevention aims to treat and rehabilitate people who have experienced an illness or injury. Education programs for people recently diagnosed with diabetes help prevent further disability and health problems, such as blindness and end-stage renal disease, from arising from the condition and improve overall health.[28] Prevention has become increasingly important as the medical community moves away from conventional medicine, which focuses on diagnosing and treating diseases, to a holistic approach that encompasses all aspects of the health spectrum.

Social–Ecological Models of Health Behavior

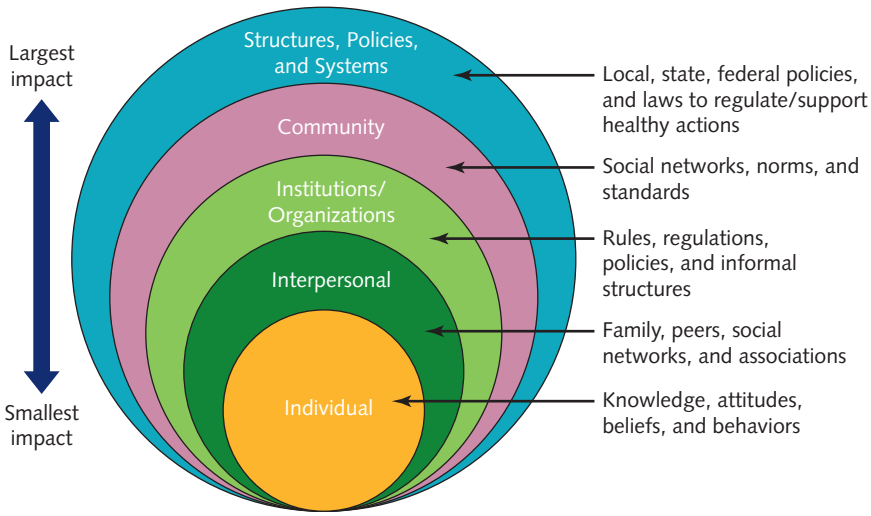
Social–ecological model (SEM) Focuses on the nature of people's interactions with their surrounding physical and sociocultural environments.

Although traditionally much emphasis was placed on strategies to change nutrition and health-related behaviors by focusing on individual-level factors such as knowledge and skills, more recent interventions focus on the contribution of environmental factors to the development of obesity and other chronic diseases. One way to frame this current thinking is the **social–ecological model (SEM)**, as shown in **Figure 1-7**, in which various levels of influence are arranged by relative proximity to the individual.[29] Thus, interpersonal relationships such as family factors are more proximal to the individual, while structures, policies, and systems, such as changes in food labeling or food costs, are more distant. **Table 1-2** provides a brief description of each of the SEM levels.

The social–ecological model helps explain the roles that various segments of society can play in making healthy choices more widely accessible and desirable. Such a framework encourages a paradigm shift to a society oriented around health promotion and chronic disease prevention. To this end, the *Dietary Guidelines for Americans* included the following call to action:[30]

> *"Ultimately, Americans make their own food and physical activity choices at the individual (and family) level. In order for Americans to make healthy choices, however, they need to have opportunities to purchase and consume healthy foods and engage in physical activity. Although individual behavior change is critical, a truly effective and sustainable improvement in the nation's health will require a multisector approach that applies the social–ecological model to improve the food and physical activity environment. This type of approach emphasizes the development of coordinated partnerships, programs, and policies to support healthy eating and active living. Interventions should extend well beyond providing traditional education to individuals and families about healthy choices and should help build skills, reshape the environment, and reestablish social norms to facilitate individuals' healthy choices."*

FIGURE 1-7 The Social–Ecological Model



Health promotion activities that focus on policy-, system-, and environmental-level settings (community and institutions/organizations) are more likely to have a greater impact on health behaviors and health disparities than individual-level interventions.

Source: Adapted from the Centers for Disease Control and Prevention (CDC), The Social Ecological Model: A Framework for Prevention.

TABLE 1-2 A Description of Social–Ecological Model (SEM) Levels of Influence

	DESCRIPTION	EXAMPLES OF INTERVENTIONS TO DECREASE OBESITY AT EACH SEM LEVEL OF INFLUENCE
Individual	Characteristics of an individual that influence behavior change, such as knowledge, attitudes, behavior, beliefs, lifestyle, self-efficacy, gender, age, genetics, religion, race/ethnicity, sexual orientation, economic status, financial resources, values, goals, priorities, literacy, body image, and other personal factors.	• A social media campaign to educate adolescents and young adults about the benefits of regular moderate physical activity. • A health educator seeks to increase the target population's knowledge and subsequently help form positive attitudes toward physical activity. • Public health nutritionist endeavors to increase knowledge about healthy food choices and skills in food shopping and meal preparation.
Interpersonal	Social networks and social support systems that can influence individual behaviors, including family, friends, peers, coworkers, health professionals, religious and/or social networks, customs, or traditions.	• Programs utilize relationships between individuals to influence change. For example, peer support groups, recipe swaps, and walking groups encourage members to keep each other accountable to nutrition and physical activity goals.
Institutional/ Organizational Settings	Organizations or social institutions with policies and regulations that affect how, or how well, resources, services, or other items are provided to an individual or group (e.g., policy for school vending machines).	• A private business park replaces fast-food and soft-drink options in the cafeteria with water, fresh sandwiches, and salad bars to encourage employees to replace unhealthy options with more healthy ones.
Community Settings	Relationships among organizations, institutions, and informational networks within defined boundaries, including the built environment (e.g., parks), community leaders, businesses, and transportation.	• In a town with disproportionately low access to fresh fruits and vegetables, a working group of local school officials, community leaders, and business owners helps establish a food cooperative as well as a biweekly farmers' market.
Structures, Policies, and Systems	Local, state, national, and global laws and policies, including policies regarding the allocation of resources (e.g., eligibility requirements for food assistance programs).	• Structural changes are made for the development of safe parks, recreational areas, and sidewalks statewide to help facilitate physical activity.

Source: Adapted from CDC's Ecological Framework for Addressing Disparities in Obesity, 2013.

Increasingly, ecological approaches to improving health have directed intervention strategies to target factors at several levels of influence, such as improving the health-promoting features of communities and reducing the abundance of high-calorie, nutrient-poor food choices. The combination of environmental, policy, social, and individual intervention strategies is credited with the major reductions in tobacco use in the United States since the 1960s, and this success has led to the application of similar approaches to many chronic health conditions today.[31]

The SEM emphasizes multiple levels of influence (such as individual, interpersonal, organizational, community, and public policy) and the idea that all elements of society combine to shape an individual's food and physical activity choices or other health behaviors, and ultimately one's chronic disease risk. The following section describes the various levels of influence found within the SEM model.[32]

- **Individual level.** The primary circle of the SEM is the individual—ultimately affected by all other levels of influence. Factors such as age, gender, income, race and ethnicity, genetics, and the presence of a disability can all influence an individual's food intake and physical activity patterns. Food intake is influenced by a constellation of biological, psychosocial, cultural, and lifestyle factors listed in Table 1-2, as well as by our personal food preferences, **cognitions**, **attitudes**, and health beliefs and practices. In order to change one's knowledge, attitudes, beliefs, and behaviors, these individual factors should be addressed.
- **Interpersonal level.** The next level in the SEM represents individuals' interactions with one another or relationships shared within social networks such as families, friends, peer groups, and health professionals. Food choices are strongly influenced by social groups. Primary social groups such as families, friends, and work groups also influence health and nutrition status. The family is a paramount source of values for its members, and its values, attitudes, and traditions can have lasting effects on the members' food choices and health. This is especially true for children and teenagers. For example, children whose parents did not regularly drink soft drinks were much less likely to consume soft drinks than children whose parents drank soft drinks on a regular basis.[33]
- **Institutional–organizational-level settings.** People regularly make decisions about food, physical activity, and health in a variety of settings, such as schools, worksites, faith-based organizations, and health-care organizations. Health promotion activities implemented at this level facilitate individual behavior change by influencing organizational systems and policies. Health-care systems, worksites, insurance plans, local health clinics, and professional organizations represent potential sources of organizational messages and supportive environments.[34] Examples of interventions appropriate for this level include encouraging the expansion of insurance benefits for medical nutrition therapy or adopting worksite policies that support healthy behaviors.
- **Community-level settings.** Communities are composed of individuals as they participate in interpersonal relationships within various groups of institutions and organizations.[35] Healthy eating and lifestyle patterns can be influenced by availability and access to recreational facilities, restaurants, fast-food outlets, supermarkets, convenience stores, and other food retail establishments. Social and cultural norms and values are guidelines that govern our thoughts, beliefs, and behaviors. These shared assumptions of appropriate behavior are based on the values of a society and are reflected in everything from laws to personal expectations. Making healthy choices can be more difficult if those healthy choices are not strongly valued within a society. As mentioned earlier, communities may be viewed on different scales: global, national, regional, local, cultural, or by other shared characteristics.

Cognitions The knowledge and awareness that people have of their environment and the judgments they make related to it.

Attitudes An individual's positive or negative evaluation of performing a behavior or engaging in an activity.

- **Structures, policies, and systems.** The outermost tier of the SEM represents the local, state, and federal structures and systems that affect the **built environment** surrounding communities and individuals.[36] Communities are influenced by many factors, such as government and its programs and policies, public health and health-care systems, agriculture and its food and agricultural policies, industry, and media. Many of these sectors determine the degree to which individuals have access to healthy food and opportunities to be physically active in their own communities.

Built environment Encompasses a variety of community design elements such as street layout, zoning, transportation options, stairs, public and green spaces, and business areas.

The social–ecological model provides guidance for developing successful programs. The most effective approach to health promotion and disease prevention uses a combination of interventions at all levels of the model. Creating a social environment conducive to change is important to making it easier for individuals to adopt healthy behaviors.

Healthy People: A Report Card for the Nation's Health

A national strategy for improving the health of the United States—known as ***Healthy People***—is released by the U.S. Department of Health and Human Services each decade. For the past four decades, *Healthy People* has provided a framework for promoting health and avoiding preventable disease. Chronic diseases, such as heart disease, cancer, and diabetes, are responsible for 7 out of every 10 deaths among people in the United States each year and account for 75% of the nation's health spending.[37] Many of the risk factors that contribute to the development of these diseases are preventable (see Figure 1-4).[38] The *Healthy People* initiative is grounded in the principle that setting **national health objectives** and monitoring progress can motivate action.

Healthy People A set of goals and objectives with 10-year targets designed to guide national health promotion and disease prevention efforts to improve the health of all people in the United States.

National health objectives Objectives that challenge the nation to improve the health of Americans through a coordinated and comprehensive emphasis on prevention.

How did the nation do in terms of meeting the *Healthy People 2020* goals? When *Healthy People 2020* was released in 2010, life expectancy was 76 years. Today, the average life expectancy at birth is 78 years and death rates for heart disease, stroke, and certain types of cancer have declined.[39] However, **health disparities** remain evident among individuals, with significant differences between whites and minorities in mortality, morbidity, health insurance coverage, and the use of health services.[40]

Health disparities Health disparities exist when a segment of the population bears a disproportionate incidence of a health condition or illness.

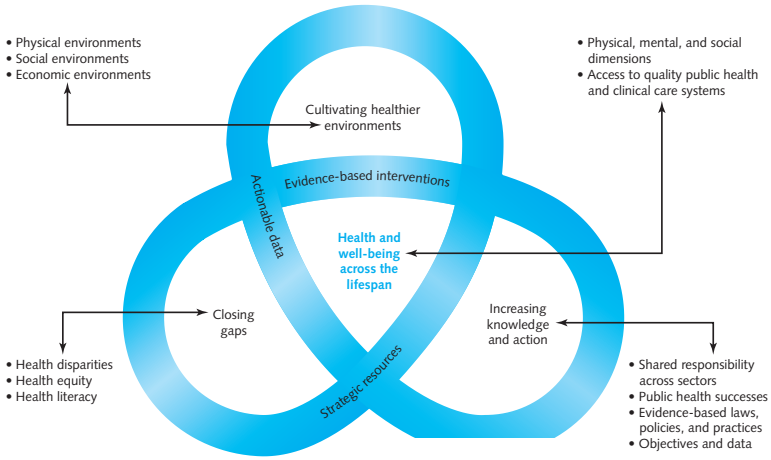
Almost no progress was made toward the *Healthy People 2020* targets for objectives in the nutrition and weight status focus area.[41] Chapter 3 provides the status of the *Healthy People* objectives for nutrition. Progress toward meeting the *Healthy People* objectives is also discussed in Chapters 8, 11, 12, and 13. Additional information about the Healthy People 2030 initiative and the complete list of *Healthy People 2030* Objectives can be located at www.healthypeople.gov.

Looking Ahead: *Healthy People 2030*

Healthy People 2030 is the national health agenda for the current decade. It was developed by a consortium of national health organizations, state health departments, the National Academy of Medicine, and the U.S. Public Health Service. The initiative identifies health improvement goals and objectives to be reached by the year 2030. It builds on the accomplishments and challenges in meeting the *Healthy People 2020* health objectives and communicates a strategy for achieving **health equity**.[42] *Healthy People 2030* assists federal and state agencies in setting priorities and in providing funding and support to organizations and institutions that are able to help achieve the *Healthy People 2030* objectives. For the United States to become a healthier nation, *prevention* must become a driving force in our health-care strategy.[43] To this end, *Healthy People 2030* aims to redirect our attention from health care to the social determinants of health in our social and physical environments.[44]

Health equity Health equity means that everyone has a fair and just opportunity to be as healthy as possible. This requires removing obstacles to health such as poverty, discrimination, and their consequences, including powerlessness and lack of access to good jobs with fair pay, quality education and housing, safe environments, and health care.

FIGURE 1-8 The *Healthy People 2030* Framework: Advancing Health, Equity, and Well-Being



The graphic visually articulates the foundational principles and core focus of the *Healthy People 2030* initiative, including: Closing gaps; Cultivating healthier environments; Increasing knowledge and action; and Health and well-being across the lifespan.

Healthy People Vision: A society in which all people can achieve their full potential for health and well-being across the lifespan.

Healthy People Mission: To promote, strengthen, and evaluate the Nation's efforts to improve the health and well-being of all people.

Foundational Principles

- Health and well-being of all people and communities are essential to a thriving, equitable society.
- Promoting health and well-being and preventing disease are linked efforts that encompass physical, mental, and social health dimensions.
- Investing to achieve the full potential for health and well-being for all provides valuable benefits to society.
- Achieving health and well-being requires eliminating health disparities, achieving health equity, and attaining **health literacy**.
- Healthy physical, social and economic environments strengthen the potential to achieve health and well-being.
- Promoting and achieving the Nation's health and well-being is a shared responsibility that is distributed across the national, state, tribal, and community levels, including the public, private, and not-for-profit sectors.
- Working to attain the full potential for health and well-being of the population is a component of decision-making and policy formulation across all sectors.

Health literacy is the degree to which an individual has the capacity to obtain, communicate, process, understand, and use basic health information and services to make appropriate health decisions.

Source: Source: Secretary's Advisory Committee on National Health Promotion and Disease Prevention Objectives for 2030 (SAC), June 2019 meeting slides; National Academies of Sciences, Engineering, and Medicine. *Leading Health Indicators 2030: Advancing Health, Equity, and Well-being*, (Washington, DC: The National Academies Press), 2020.

Goals of *Healthy People 2030*

The goals for *Healthy People 2030* continue the tradition of earlier *Healthy People* initiatives and advocate for improvements in the health of all people (**Figure 1-8**). The goals address the environmental factors that contribute to health and disease by placing particular emphasis on the social determinants of health. As was shown in Figure 1-6, social determinants of health are the range of social, economic, health-care, education, and environmental factors that determine the health status of individuals or populations. Determinants in the physical environment include housing, transportation, and other aspects of our built environments.

The overarching goals of *Healthy People 2030* include:[45]

- **Goal 1:** ***Attain healthy, thriving lives and well-being, free of preventable disease, disability, injury, and premature death.*** This goal emphasizes the importance of prevention and health promotion for all people. Even people with diseases that cannot be prevented or cured can benefit from health promotion efforts that slow functional declines or improve the ability to live independently and participate in community life.

  This goal also considers problems such as violence or lack of preparedness for natural and manmade disasters. Since the launch of *Healthy People 2030*, concerns about rapidly evolving public health crises, such as the COVID-19 pandemic, have added urgency to the importance of *preparedness* as a public health issue. As the COVID-19 pandemic unfolded in 2020, it exposed the basic structural deficiencies of health care systems and the longstanding economic and health disparities existing among people who are food insecure, living in under-resourced communities, or are experiencing homelessness. The COVID-19 pandemic presented numerous challenges to address, including the need to better prepare the nation's food, health care, and public health systems for future public health emergencies in order to better protect vulnerable populations.[46] Being prepared for any emergency is a high priority for public health in the current decade.
- **Goal 2:** ***Eliminate health disparities, achieve health equity, and attain health literacy to improve the health and well-being of all.*** This goal reflects the increasing diversity of the population and recognizes that gender, race, and ethnicity; income and education; rural or urban location; disability; and sexual orientation are major factors that affect access to health-care services and contribute to health disparities.

  To eliminate health disparities and promote health equity, it is necessary to address all determinants of health disparities that can be influenced by institutional policies and practices. These include disparities in health care as well as other health determinants, such as the conditions of daily life and the circumstances in which people are born, grow, work, and age.[47]
- **Goal 3:** ***Create social, physical, and economic environments that promote attaining full potential for health and well-being for all.*** This goal takes an ecological approach to health promotion. Health and health behaviors are determined by influences at multiple levels, including personal, organizational/institutional, environmental, and policy levels. Because dynamic interrelationships exist among these different levels of health determinants, interventions are most likely to be effective when they address determinants at all levels. Policies that can increase the income of low-income persons and communities (e.g., through education, job opportunities, and improvement in public infrastructure) may improve population health. Reducing inequalities in the physical environment (e.g., access to healthful foods, safe recreational areas, and transportation) can also improve key health behaviors and other determinants, thereby helping to meet numerous health objectives.
- **Goal 4:** ***Promote healthy development, healthy behaviors, and well-being across all life stages.*** This goal emphasizes promotion of health throughout the life cycle and highlights the importance of tailoring strategies to fit a particular age group, since the determinants of health change as a person develops. Topic areas include maternal, infant, and child health; adolescent health; and older adults.
- **Goal 5:** ***Engage leadership, key constituents, and the public across multiple sectors to take action and design policies that improve the health and well-being of all.*** This goal emphasizes the need to separate health-care policy from health policy and proposes that the ultimate aim of health policy should be well-being. The goal is intended to motivate all policymakers to examine how their policies add to or detract from the overall *well-being* of their constituents.[48] In the book, *Being* Mortal,[49] the author makes the case for why populations would benefit from "well-being in all policies": "We've

been wrong about what our job is in medicine. We think our job is to ensure health and survival. But really it is larger than that. It is to enable *well-being*. And *well-being* is about the reasons one wishes to be alive."

Healthy People in Healthy Communities The *Healthy People 2030* goals represent the nation's hope for the improved health of its citizens, and they can serve as the foundation for all work toward health promotion and disease prevention. As stated, however, they are too broad to implement. The working groups therefore also laid out objectives with specific, measurable targets to be achieved by the year 2030. These objectives are grouped into broad topic areas, such as access to health services, cancer, diabetes, food safety, heart disease and stroke, nutrition and healthy eating, and physical activity, as shown in **Table 1-3** *Healthy People 2030* balances the comprehensive set of health objectives with a smaller list of public health priorities for the decade, known as *leading health indicators*. For each of the leading health indicators, specific objectives from *Healthy People 2030* are used to track the progress made in improving the nation's health and to provide periodic "snapshots" of the nation and its communities during the decade (**Table 1-4**).[50] Progress can be tracked at *www.healthypeople.gov*.

Many nutrition-related activities are considered essential to the overall *Healthy People* initiative because four of the leading causes of death in the United States are related to dietary imbalance and excess (coronary heart disease, some types of cancer, stroke, and diabetes mellitus). Diet also contributes to the development of other conditions, such as hypertension, osteoporosis, obesity, dental caries, and diseases of the gastrointestinal tract.[51]

TABLE 1-3 *Healthy People 2030* Topic Areas

The topic areas identify and group objectives of related content, highlighting specific issues and populations. Each topic area is assigned to one or more lead agencies within the federal government that is responsible for developing, tracking, monitoring, and periodically reporting on objectives.

1. Addiction
2. Adolescent health
3. Arthritis, osteoporosis, and chronic pain
4. Blood disorders and blood safety
5. Cancer
6. Chronic kidney disease
7. Dementias, including Alzheimer's disease
8. Diabetes
9. Drug and alcohol use
10. Economic stability
11. Education access and quality
12. Emergency Preparedness
13. Environmental health
14. Family planning
15. Foodborne illness and safe food handling
16. Global health
17. Health care access and quality
18. Health care–associated infections
19. Health care, health insurance, and health policy
20. Health communication and health information technology
21. Heart disease and stroke
22. Hospital and emergency services
23. Infectious disease
24. Injury and violence prevention
25. Lesbian, gay, bisexual, and transgender health
26. Maternal, infant, and child health
27. Mental health and mental disorders
28. Neighborhood and built environment
29. Nutrition and healthy eating
30. Occupational safety and health
31. Older adults
32. Oral health
33. Overweight and obesity
34. People with disabilities
35. Physical activity
36. Preventive care
37. Public health infrastructure
38. Respiratory disease
39. Sensory or communication disorders
40. Sexually transmitted infections
41. Sleep health
42. Social determinants of health
43. Tobacco use
44. Vaccination

[a] Source: *Healthy People 2030*. Additional information about the *Healthy People 2030* initiative, Topic Areas, and Objectives can be located at www.healthypeople.gov.

TABLE 1-4 A Sampling of Leading Health Indicator Topic Areas and Objectives Used to Track Progress on the *Healthy People 2030* Initiative[a]

LEADING HEALTH INDICATOR (LHI)[b]	OBJECTIVE TO MEASURE PROGRESS	HEALTHY PEOPLE FRAMEWORK CONCEPT (SEE FIGURE 1-8)
Life expectancy	Increase life expectancy (at birth)	Closing gaps: Health Equity
Child health	Reduce the rate of infant deaths	Health and Well-Being Across the Lifespan: Physical Health
Disability	Reduce the percentage of adults aged 65 years and over with limitations in daily activities	Health and Well-Being Across the Lifespan: Physical Health
All cancer deaths	Reduce the overall cancer death rate	Health and Well-Being Across the Lifespan: Physical Health
Maternal mortality rate	Reduce maternal deaths	Closing Gaps: Health Equity
Oral conditions	Increase the proportion of children, adolescents, and adults who use the oral health care system	Health and Well-Being Across the Lifespan: Physical Health
Tobacco	Reduce the use of any tobacco products by adolescents	Increasing knowledge and action: Evidence-based laws, policies, and practices
Obesity	Reduce the proportion of children and adolescents with obesity	Health and Well-Being Across the Lifespan: Physical Health
Hypertension rate	Reduce the proportion of adults with hypertension	Health and Well-Being Across the Lifespan: Physical Health
Health insurance coverage	Increase the proportion of people with health insurance	Health and Well-Being Across the Lifespan: Access to Quality Public Health and Clinical Care Systems
Affordable housing	Reduce the proportion of all households that spend more than 30 percent of income on housing	Cultivating Healthier Environments: Social Environment
Poverty	Reduce the proportion of people living in poverty	Cultivating Healthier Environments: Economic Environment
Food security	Reduce household food insecurity and hunger	Cultivating Healthier Environments: Social Environment

[a]Additional information about the *Healthy People 2030* initiative and updated Leading Health Indicators, Topic Areas, and Objectives for 2030 can be located at www.healthypeople.gov.

[b]Certain LHIs can represent a series of *Healthy People* objectives that are of a similar nature. For example, in order for the prevalence of hypertension to decrease, many things need to happen: Salt in the food supply and in people's diets needs to decrease; people need to have access to good quality health care, people need to be able to afford their medications and/or change their behavior to achieve hypertension control.

Source: Adapted from National Academies of Sciences, Engineering, and Medicine 2020. *Leading Health Indicators 2030: Advancing Health, Equity, and Well-Being*. Washington, DC: The National Academies Press. https://doi.org/10.17226/25682.

Some of the *Healthy People* nutrition-related objectives focus on improving health status. For example, one objective calls for reducing the proportion of adults with obesity. Several objectives focus on health risk reduction and specify targets for the intake of nutrients such as sodium and of foods such as fruits, vegetables, and whole grains. Other nutrition-related objectives set targets for the prevalence of iron-deficiency anemia and the proportion of worksites that offer nutrition or weight management counseling.[52] Some objectives address the special needs of various age groups, such as adolescents or older adults, whereas others focus on special population groups, including women who are pregnant.

Surveillance An approach to collecting data on a population's health and nutrition status in which data collection occurs regularly and repeatedly.

Each *Healthy People 2030* objective has a target for specific improvements to be achieved by the year 2030. The **surveillance** and data-tracking systems of *Healthy People 2030* systematically collect and analyze health data to understand the nation's health status and plan prevention programs.[53]

The ultimate objective of public health is to lower the risk of disease and disability and to discourage risky behaviors in the first place.[54] Thus, many of the nutrition or educational programs and services developed by public health practitioners to meet the objectives of *Healthy People* focus on people in groups, whether they be families, schools, workplaces, cities, or nations. Such strategies target people of all ages and segments within the community. Refer to the Internet Resources at the end of this chapter for sites related to *Healthy People* initiatives and other sites of interest to community nutritionists.

Community Nutrition Practice

Earlier in the chapter, we defined *community nutrition* as a discipline that strives to improve the nutrition and health of individuals and groups within communities. How do community nutritionists do this? What skills are needed to accomplish this goal? What job responsibilities do community nutritionists have? This book answers these questions and introduces you to the challenges of working in communities today. Imagine for a moment that you are a community nutritionist in each of the following situations:

- An article in the *New York Times* describes the high rates of substance abuse, teen pregnancy, HIV infection, sexually transmitted diseases, smoking, and eating disorders among U.S. adolescents. Long concerned about this issue, your public health department plans an assessment of the health and nutrition status of teenagers in your county. Your job is to coordinate and lead the community assessment. Where do you start? What is the purpose of your assessment? What types of data do you collect? What information already exists about this population? Should your department work with other agencies to collect data? How will the results of your assessment be used to improve the health of teenagers in your community?
- As the director of health promotion for a large nonprofit health organization, you are responsible for developing and implementing programs to reduce the risk of cardiovascular diseases among people living in your state. Your organization's board of directors has called for an assessment of the effectiveness of all programs in your area. How do you evaluate program effectiveness? What types of data should be collected to show that each program reaches an appropriate number of people at a reasonable cost and helps them make behavioral changes to reduce their risk of heart attack and stroke? How will you present your findings to the board?
- You are attracted to the challenge of building a business and believe that your training in nutrition and exercise physiology can help people in your community get fit and improve their lifestyles. What is an attractive name for your business?

Where should it be located? What services will you offer and to whom? Who are your competitors? How will you market your services? Can you use social media to enhance your business?

- You are employed by the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) in your state, and you have noticed that Spanish is the first language for an increasing number of your clients. You and your colleagues want to offer these clients more materials and services in Spanish. Should you adapt existing English-language materials for these clients or develop new materials from scratch? Are the existing English-language materials culturally appropriate for your Hispanic clients? What are other state WIC programs doing to address this issue?

Common themes are apparent in these situations. All refer to gathering information about the community itself or about people who use or implement community-based programs and services. Although it may not be clear to you now, all involve issues of policy, program management, and cost. All entail making decisions about how to use scarce resources. All are concerned with determining whether nutrition programs and services are reaching the right audience with the right messages and having the desired effect. All describe challenges of a trained professional—the community nutritionist—who identifies a nutritional need in the community and then puts into place a program or service designed to meet that need.

Educational Requirements

Community nutritionists have a a comprehensive background in nutrition science, medical nutrition therapy, health education, and public health. Marketing skills are also important because it is no longer sufficient merely to know *which* nutrition messages to deliver. It is also necessary to know *how* to deliver them effectively in a variety of media formats to a variety of audiences.

The minimum educational requirements for a community nutritionist include a bachelor's degree in community nutrition, foods and nutrition, or dietetics from an accredited college or university. Most community nutrition positions require registration as a dietitian by the Academy of Nutrition and Dietetics. Some positions also require graduate-level training to obtain additional competencies in areas such as quality assurance, biostatistics, research methodology, health program planning and management, survey design and analysis, and the behavioral sciences. Community nutritionists who are registered dietitians are expected to have the core competencies listed on page 24.

Although nutrition and dietetic technicians, registered (NDTRs), are most often employed in the foodservice sector and clinical settings, some do work in the community arena. Community-based NDTRs assist the community nutritionist in determining the community's nutritional needs and in delivering community nutrition programs and services. NDTRs must have at least an associate degree and must pass the registration examination developed by the Commission on Dietetic Registration (CDR).

think like a COMMUNITY **NUTRITIONIST**

Particular skills and competencies are important for success in the field of community nutrition. Use the box on pages 24 and 25 to review the skill set of a community nutritionist. Then list knowledge and competencies you believe you already have, ones that you are working on developing, and ones that are not yet developed. Lastly, circle the knowledge and competency items you would like to further develop during this course. You can reevaluate your progress at the end of the course.

Basic Competencies of the Community Dietitian

- *Scientific and Evidence Base of Practice: Integration of scientific information and research into practice*
  - Select indicators of program quality and/or customer service and measure achievement of objectives (*Tip:* Outcomes may include clinical, programmatic, quality, productivity, economic, or other outcomes in wellness, management, sports, clinical settings, etc.)
  - Apply evidence-based guidelines, systematic reviews, and scientific literature in the nutrition care process and model and other areas of dietetics practice
  - Justify programs, products, services, and care using appropriate evidence or data
  - Evaluate emerging research for application in dietetics practice
  - Conduct projects using appropriate research methods, ethical procedures, and data analysis

- *Professional Practice Expectations: Beliefs, values, attitudes, and behaviors for the professional dietitian level of practice*
  - Practice in compliance with current federal regulations and state statutes and rules, as applicable and in accordance with accreditation standards and the Scope of Dietetics Practice and Code of Ethics for the Profession of Dietetics
  - Demonstrate professional writing skills in preparing professional communications (Tip: Examples include research manuscripts, project proposals, education materials, policies, and procedures.)
  - Design, implement, and evaluate presentations to a target audience (Tip: A quality presentation considers life experiences, cultural diversity, and educational background of the target audience.)
  - Use effective education and counseling skills to facilitate behavior change
  - Demonstrate active participation, teamwork, and contributions in group settings
  - Assign patient care activities to NDTRs and/or support personnel as appropriate
  - Refer clients and patients to other professionals and services when needs are beyond individual scope of practice
  - Apply leadership skills to achieve desired outcomes
  - Participate in professional and community organizations
  - Establish collaborative relationships with other health professionals and support personnel to deliver effective nutrition services
  - Demonstrate professional attributes within various organizational cultures (Tip: Professional attributes include showing initiative and proactively developing solutions, advocacy, customer focus, risk taking, critical thinking, flexibility, time management, work prioritization, and work ethic.)
  - Perform self-assessment, develop goals and objectives, and prepare a draft portfolio for professional development as defined by the Commission on Dietetics Registration
  - Demonstrate negotiation skills (*Tip:* Include showing assertiveness when needed while respecting the life experiences, cultural diversity, and educational background of the other parties.)

- *Clinical and Customer Services: Development and delivery of information, products, and services to individuals, groups, and populations*
  - Perform the Nutrition Care Process (steps a–e below) and use standardized nutrition language for individuals, groups, and populations of differing ages and health status in a variety of settings (See the Professional Focus feature in Chapter 6 for more about the Nutrition Care Process.)
    a. Assess the nutrition status of individuals, groups, and populations in a variety of settings where nutrition care is or can be delivered
    b. Diagnose nutrition problems and create problem, etiology, and signs and symptoms (PES) statements
    c. Plan and implement nutrition interventions to include prioritizing the nutrition diagnosis, formulating a nutrition prescription, establishing goals, and selecting and managing the intervention
    d. Monitor and evaluate problems, etiologies, signs, symptoms, and the impact of interventions on the nutrition diagnosis

continued

e. Complete documentation that follows professional guidelines, guidelines required by health-care systems, and guidelines required by the practice setting

- Demonstrate effective communications skills for clinical and customer services in a variety of formats (*Tip:* Formats include oral, print, visual, electronic, and mass media methods for maximizing client education, employee training, and marketing.)
- Develop and deliver products, programs, or services that promote consumer health, wellness, and lifestyle management (Tip: Consider health messages and interventions that integrate the consumer's desire for taste, convenience, and economy with the need for nutrition and food safety.)
- Deliver respectful, science-based answers to consumer questions concerning emerging trends
- Coordinate procurement, production, distribution, and service of goods and services (*Tip:* Demonstrate and promote responsible use of resources including employees, money, time, water, energy, food, and disposable goods.)
- Develop and evaluate recipes, formulas, and menus for acceptability and affordability that accommodate the cultural diversity and health needs of various populations, groups, and individuals

▶ *Practice Management and Use of Resources: Strategic application of principles of management and systems in the provision of services to individuals and organizations*

- Participate in management of human resources
- Perform management functions related to safety, security, and sanitation that affect employees, customers, patients, facilities, and food
- Participate in public policy activities, including both legislative and regulatory initiatives
- Conduct clinical and customer service quality management activities
- Use current informatics technology to develop, store, retrieve, and disseminate information and data
- Analyze quality, financial, or productivity data and develop a plan for intervention
- Propose and use procedures as appropriate to the practice setting to reduce waste and protect the environment
- Conduct feasibility studies for products, programs, or services with consideration of costs and benefits
- Analyze financial data to assess utilization of resources
- Develop a plan to provide or develop a product, program, or service that includes a budget, staffing needs, equipment, and supplies
- Code and bill for dietetic/nutrition services to obtain reimbursement from public or private insurers

Source: Core Knowledge & Competencies for the RD, ACEND accrediting agency of the Academy of Nutrition and Dietetics (formerly the American Dietetic Association). Reproduced with permission.

Practice Settings

The practice settings of community nutritionists include schools, worksites, cooperative extension agencies, universities, colleges, medical schools, voluntary and nonprofit health organizations, public health departments, home health care agencies, day care centers, residential facilities, fitness centers, sports clinics, hospital outpatient facilities, food companies, wellness programs, and homes (their own or those of their clients). Some community

nutritionists work as consultants, providing nutrition expertise to government agencies, food companies, foodservice companies, or other groups who are planning community-based services or programs with a nutrition component.

Community nutritionists are also employed by world and regional health organizations. WHO's Division of Family Health, located at WHO headquarters in Geneva, Switzerland, includes an office of nutrition. Likewise, the North American regional WHO office in Washington, D.C., which is known officially as the Pan American Sanitary Bureau and coexists with the Pan American Health Organization (PAHO), has a strong nutrition mandate. The PAHO directs its efforts toward solving nutritional problems in Latin America and the Caribbean. Another prominent organization in global community nutrition is the Food and Agriculture Organization (FAO) of the United Nations. The programs of the Food Policy and Nutrition Division of FAO are directed toward improving the nutrition status of at-risk populations and ensuring access to adequate supplies of safe, good-quality foods.[55] For more about global nutrition issues, see Chapter 14.

Roles and Responsibilities

Community nutritionists play many roles: educator, counselor, advocate, coordinator, generator of ideas, facilitator, and supervisor. They interpret and incorporate new scientific information into their practice and provide nutrition information to individuals, specialized groups, and the general population. Their focus is normal nutrition, although they sometimes cover the principles of medical nutrition therapy and nutritional care in disease for certain groups (e.g., HIV-positive children or people with diabetes).[56] In addition to serving the general public, community nutritionists refer clients to other health professionals when necessary and participate in professional activities.

Essential Practices of the Community Nutritionist

- Manage nutrition care for diverse population groups across the lifespan.
- Participate in nutrition surveillance and monitoring of communities.
- Develop and implement community-based food and nutrition programs.
- Conduct outcome assessment and evaluation of community-based food and nutrition programs.
- Collaborate in community-based research.
- Participate in food and nutrition policy development and evaluation based on community needs and resources.
- Consult with organizations regarding food access for target populations.
- Develop and implement a health promotion/disease prevention intervention project.
- Participate in screening activities such as measuring hematocrit and cholesterol levels.

Community nutritionists are responsible for planning, evaluating, managing, and marketing nutrition services, programs, and interventions. Nutrition services range from individual counseling for weight management, blood cholesterol reduction, and eating disorders to consulting services provided for food companies and institutions such as residential centers and nursing homes. Nutrition programs may be national in focus, such as the WIC program, or local, such as Healthy Start for Mom and Me, a prenatal nutrition program for low-income, high-risk pregnant women in Winnipeg, Manitoba, Canada.[57] Community nutritionists who develop programs identify nutrition problems within the community, obtain screening data on target groups, locate information on community resources, develop education materials, disseminate nutrition information through the media, evaluate the effectiveness of programs and services, negotiate contracts for nutrition programs, train staff and community workers, and document program services.[58] Examples of essential practices of the community nutritionist are listed in the margin.[59]

The job responsibilities of community nutritionists are similar across practice settings. The community nutritionists whose responsibilities are shown in **Table 1-5** are all involved in assessing the nutrition status of individuals or identifying a nutritional problem within a community. They all have opportunities for teaching their clients about foods, diet, nutrition, and health and for addressing emerging issues in community nutrition. Some are involved in the budget process and in developing marketing strategies; others are not. The community nutritionist in private practice does it all!

Community nutritionists are also expected to be multiskilled or cross-trained (**Table 1-6**). Multiskilled practitioners perform more than one function, often in more than one discipline. The multiskilled community nutritionist knows not only how to conduct a needs assessment and provide dietary guidance but also how to design and conduct

TABLE 1-5 Responsibilities of Community Nutritionists in Diverse Practice Settings

POSITION: CHILD NUTRITION SPECIALIST, STATE DEPARTMENT OF EDUCATION	POSITION: NUTRITIONIST, SPECIAL SUPPLEMENTAL NUTRITION PROGRAM FOR WOMEN, INFANTS, AND CHILDREN (WIC)
Responsibilities 1. Interprets USDA's regulations, policies, and procedures related to the National School Lunch Program for users of the program 2. Trains program users in such areas as how to count meals and keep records accurately, how to determine that menus meet current nutrition requirements, and which foods can be ordered through the USDA Foods in Schools program 3. Revises training manuals 4. Audits program user compliance with USDA's regulations and procedures, including assessing whether student eligibility for participation in the program was determined correctly, ensuring that proper accounting procedures have been followed, and creating an action plan when the program user has not complied with the USDA regulations and procedures	**Responsibilities** 1. Determines client's eligibility for program, using WIC program criteria (e.g., presence of anemia, underweight/overweight, prior pregnancies, inadequate diet) 2. Assesses the nutrition status of clients 3. Determines the adequacy of the client's diet 4. Provides one-on-one nutrition counseling 5. Conducts in-person and virtual group sessions for clients on basic nutrition topics such as food sources of iron and calcium 6. Helps clients understand how to use the WIC-approved foods in their daily diets 7. Assists in developing educational materials as required 8. Assists in reviewing client records and monitoring health data posted to records as required
POSITION: DIRECTOR OF HEALTH PROMOTION, FIRST-RATE SPA AND HEALTH RESORT	**POSITION: PRESIDENT/OWNER, CORNERSTONE NUTRITION SERVICES**
Responsibilities 1. Develops, implements, and evaluates programs in the areas of nutrition, fitness, weight management, and risk reduction (e.g., blood cholesterol reduction, stress management, smoking cessation) 2. Assists the director in developing social marketing strategies for programs 3. Prepares program budgets 4. Tracks program expenses 5. Teaches nutrition/fitness to groups of clients 6. Supervises dietitians and other staff involved in counseling clients and fitness assessments	**Responsibilities** 1. Sets business goals and objectives 2. Manages all aspects of company's programs and services, including developing programs and services, developing educational materials and teaching tools, and evaluating the success of programs and services 3. Develops and evaluates a marketing plan 4. Identifies new business opportunities 5. Tracks income (including billings) and expenses for tax purposes 6. Maintains client records 7. Networks with colleagues in business and the community

a survey, use an Internet website for marketing health messages, and obtain funding to support a program's promotional plan. Survey design and analysis, marketing, Internet technology, and grant writing are important disciplines for community nutritionists. And in today's culturally diverse environment, multilingual community nutritionists are in demand. The Professional Focus for this chapter—"Community-Based Nutrition Professionals"—highlights important skills and practice activities from a variety of community nutrition jobs (see pages 34–44).

TABLE 1-6 Multiskilling in Community Dietetics

- Basic understanding of the epidemiology and surveillance of health conditions such as diabetes, including the origin and availability of data sets
- Knowledge of how to influence policy development
- Ability to do an evaluation that will drive program changes
- Knowledge of how to effect change by developing broad-based community partnerships
- Knowledge of how to write grant applications
- Familiarity with budget development, justification, and management skills
- Knowledge of how to work with different cultures and adapt approaches based on the specific needs of each culture
- Knowledge of how to promote health through social marketing
- Knowledge of how to facilitate health system change

Source: Public Health and Community Nutrition Practice Group, www.eatright.org.

Entrepreneurship in Community Nutrition

Entrepreneurship is important in community nutrition. What is entrepreneurship? Who is an entrepreneur? How is entrepreneurship related to community nutrition? In the business world, entrepreneurship is defined as the act of starting a business or the process of creating new "values," be they goods, services, methods of production, technologies, or markets.[60] The essence of entrepreneurship is innovation. Consider the late Ray Kroc of McDonald's. He did not invent the hamburger, but he did develop an entirely new way of marketing and delivering it to his customers. In the process, he revolutionized the foodservice industry.

Entrepreneurship Creating something of value through the creation of organization.

Entrepreneurship, then, is the creation of something of value, be it a product or a service, through the creation of organization. In this context, *organization* means orchestration of the materials, people, and capital required to deliver a product or service. This definition encompasses the myriad actions of individuals—the entrepreneurs—who invent or develop some new product or service that is valued by the community or marketplace.[61]

Entrepreneur One who undertakes the risk of a business or enterprise.

An **entrepreneur** is an innovator, initiator, promoter, and coordinator. Entrepreneurs are change agents who seek, recognize, and act on opportunities. They ask "What if?" and "Why not?" and translate their ideas into action. Entrepreneurs tend to be creative, are able to see an old problem in a new light, and are willing to break new ground in delivering a product or service. When they spot an opportunity to fill a niche in the marketplace, they work to bring together the expertise, materials, labor, and capital necessary to meet the perceived need or want. Two entrepreneurs in community nutrition are Oklahoma dietitians Kellie Bryant, MS, RD, LD, and Mary S. Callison, MS, RD, LD, who developed a nutrition newsletter for Head Start programs. They observed that Head Start programs, particularly on Indian reservations and in rural areas, lacked practical informational pieces on child health and on how to shop for, cook, store, and serve healthful foods. Their *Primarily Nutrition* newsletter is marketed to Head Start programs, which distribute it to clients and their families.[62] Janet Helm, MS, RD, and Lori Fromm, MS, RD, the two registered dietitians who launched the Nutrition Blog Network—a collection of blogs written by registered dietitians—are also entrepreneurs.[63] They spotted a new social media trend and learned how to harness it for educating consumers, with trusted advice from nutrition experts on topics ranging from pregnancy to senior nutrition, gluten-free to "green," and diabetes to diet myths. The blog directory helps dietitians network and become more visible online.

Entrepreneurs share some common personality traits. They are achievers, setting high goals for themselves. They work hard, are good organizers, enjoy managing a project to completion, and accept responsibility for their ventures. They strive for excellence and are optimistic, believing that now is the best of times and anything is possible.[64]

Activities of Entrepreneurs

- Identify an opportunity
- Create a solution
- Conduct market research
- Establish business objectives
- Set up an organizational structure
- Determine personnel requirements
- Prepare a financial plan
- Locate financial resources
- Prepare a production plan
- Prepare a management plan
- Prepare a marketing plan
- Produce and test-market the product
- Build an organization

What do entrepreneurs do? One study of entrepreneurs identified at least 57 separate activities associated with launching a new venture—a clear indication of how complex entrepreneurial behavior can be. Entrepreneurs have wide-ranging competencies in areas such as planning, marketing, networking, budgeting, and team building. They turn their creative vision into deliberate decision-making and problem-solving actions to accomplish their goals. They are not just managers, although they typically "manage" themselves well. Their high self-esteem stems from a strong belief in their own personal worth, which strengthens their capacity for self-management. Successfully managing oneself means being in control (i.e., having willpower), knowing one's personal strengths and weaknesses, and being willing to change one's behavior and graciously make use of feedback and criticism.

What relevance does entrepreneurship have to community nutrition? The answer to this question will become increasingly clear as you read the remaining chapters of this book. Suffice it to say at this point that *creativity* and *innovation*—the essence of entrepreneurship—are as important to the discipline of community nutrition as to any other field. Consider the entrepreneurial activities listed in the margin. Nearly all are relevant for the community nutritionist: recognizing an opportunity to deliver nutrition and health

messages, developing an action plan for a target audience, building the team for delivering a nutrition program or service, developing a marketing plan, and evaluating the effectiveness of the nutrition program or service.[65]

Community nutritionists who want to change people's eating habits must be able to see new ways of reaching desired target groups. The strategy that works well with Hmong adolescents in California will probably not be successful with institutionalized older adult Hmong women living in Michigan. Community nutritionists must draw on theories and skills from the disciplines of sociology, educational psychology, medicine, communications, health education, technology, and business to develop programs for improving people's eating patterns. The twin stanchions of entrepreneurship—creativity and innovation—assist the community nutritionist in achieving the broad goal of improved health for all.

Social and Economic Trends for Community Nutrition

Based on population trends in the United States, it is estimated that by the year 2060 . . .

- Another 72 million people may be added to the U.S. population, increasing from 328 million in 2019 to 400 million by 2058.
- By 2060, life expectancy for the total population is projected to increase by about 6 years, from 79.7 in 2017 to 85.6 in 2060. By 2060, the average 65-year-old man will expect to live 21.7 more years, while 65-year-old women are projected to live 24.4 more years.
- As life expectancy rises in the coming decades, the U.S. population is projected to rapidly age. By 2034, people age 65 and older are projected to outnumber children under the age of 18, and by 2060, nearly 1 in 4 Americans will be at least 65 years old. The combination of rising life expectancy and an aging population will likely change demands for health care, social services, and caregiving.
- Total national spending on long-term health care will have risen to $207 billion—up from $115 billion in 1997; spending on home care will account for about one-third of spending on long-term care.
- The population and labor force will continue to diversify as immigration continues to account for a sizable part of the population growth. Certain states and cities, especially those on the East and West coasts, can be expected to receive a disproportionately large number of immigrants.
- Since the 1970s, the United States has been moving toward a cultural plurality, where no single ethnic or racial group is a majority. Census data indicate that diverse racial and ethnic groups in the United States have increased to approximately one-fourth to one-third of the population, with those reporting belonging to two or more racial groups as the fastest-growing segment. This trend is expected to continue, with minority groups climbing to 56% of the total population by the year 2060, as compared with 38% in 2014. By 2045, non-Hispanic whites will no longer make up a majority of the U.S. population. Hispanics, Asians, and Pacific Islanders have been increasing more rapidly than the rest of the U.S. population. Hispanics account for nearly 18% of the U.S. population as the largest minority group, exceeding African Americans who account for 13% of the population. These changes are due to alterations in immigration laws (the foreign-born population has more than doubled in the past 20 years), by corporate expansions into the global market, and by the tendency for minorities and immigrants to have higher birth rates.

Source: L. Medina, S. Sabo, and J. Vespa, Living Longer: Historical and Projected Life Expectancy in the United States, 1960 to 2060 (Current Population Reports, P25-1145); J. Vespa, L. Medina, and D. M. Armstrong, Demographic Turning Points for the United States: Population Projections for 2020 to 2060 (Current Population Reports, P25-1144), U.S. Census Bureau, Washington, DC, 2020; K. R. Humes and coauthors, *Overview of Race and Hispanic Origin: 2010*, U.S. Census Bureau, March 2011; Minority Health, Centers for Disease Control and Prevention.

Recent social and economic trends have important consequences for community nutrition. For example, the demographic profile of many communities is changing rapidly, along with the client mix served by community nutritionists. In North America, the aging of the population, coupled with a more ethnically diverse society, will challenge community nutritionists to develop new products and services. As society becomes more ethnically diverse, more knowledge of health beliefs, cultural foods, and values is needed. Consequently, a variety of alternative educational strategies will be needed to reach consumers whose education, training, income, language skills, time pressures, and economic potential will be highly diverse.[66] See Chapter 15 for more about gaining cultural competence in community nutrition practice.

Generational Diversity

Most of the Baby Boomers—those people born between 1946 and 1964—have reached their peak earning years or retired and are expected to be a leading market force in redefining how to live as older adults.[67] At the same time, the younger generations are emerging with new values and attitudes about health, lifestyles, and society. The generations can differ in workplace values, lifestyle and social values, motivation, learning and communication styles, and technical competence (**Table 1-7**). Community dietitians will need to understand the characteristics of these distinct generations in order to develop skills, tools, and resources for communicating nutrition and health information most effectively to individuals throughout these groups.

TABLE 1-7 Characteristics and Insights Regarding Current U.S. Generations

GENERATION AND BIRTH YEARS	CHARACTERISTICS AND INSIGHTS
Matures/Traditionalists, Pre-1946	Respect authority; avoid challenging the system; place duty before pleasure; value honor, integrity, personal ties and relationships; give information on a "need-to-know" basis; not completely comfortable with technology-based delivery of information and services.
Baby Boomers, 1946–1964	Live to work; committed to climbing the ladder of success; optimistic; strive for convenience and personal fulfillment; first wave of dual-income, dual-career families; interested in interpersonal communication; gently question status quo; team- and process-oriented; want to see big picture of an organization; will crusade for a cause; desire to preserve their youth and be nostalgic about it; enjoy unprecedented influence on government, corporate, and organizational policies and consumer products because of their numbers; comfortable with technology.
Generation X (the Baby Bust), 1965–1980	Work to live, not live to work; first generation of latchkey kids; independent, resourceful, entrepreneurial, and focused on personal growth; desire versatility, challenging work, and substantial financial rewards; aggressively question status quo and authority, interested in removing outdated work models; believe in clear, consistent expectations.
Millennials (the Baby Boom Echo), 1981–1996	Live in the moment; earn to spend; rely on immediacy of technology; grew up with the Internet; comfortable in getting, using, and sharing information that is visual, fast-paced, and conceptual; prefer to be tech-savvy and multitasking; enjoy collaborative efforts; more culturally diverse than other generations; social-minded and altruistic; demand respect and often question everything; need clear expectations to ensure productivity.
Generation Z (Gen Z or Post-Millenials), 1997–2012	First generation to be born into a digital world and the most electronically connected generation in history; from an early age, have used the Internet, laptops, cell phones, text messaging, multimedia players, wireless, video games, YouTube, and weblogs; communicate and collaborate in real-time regardless of physical location; access information easily.

Sources: Adapted from J. Jarratt and J. B. Mahaffie, "Key trends affecting the dietetics profession and the American Dietetic Association," *Journal of the American Dietetic Association* 102 (2002): 1825; C. Alexander, "*Understanding generational differences helps you manage a multi-age workforce*," *The Digital Edge*, July 2001; D. Brown, "Ways dietitians of different generations can work together," *Journal of the American Dietetic Association* 103 (2003): 1461.

Increasing Emphasis on Addressing Health Disparities

Not all cultural groups have the same health status. There are substantial **health disparities** in segments of the population—disparities based on gender, age, race or **ethnicity**, education, income, religion, disability, geographic location, sexual orientation, or other characteristics historically linked to discrimination or exclusion. Disparities can exist regarding access to health care; delivery of quality, competent health-care services; and health outcomes. The incidence of chronic disease, disability, and death is higher among certain populations including Blacks/African Americans, Hispanics/Latinxs, American Indians/Alaska Natives, Asian Americans, Native Hawaiians and other Pacific Islanders.[68] Adults with physical disabilities are four times more likely to report being in fair or poor health as compared to those without disabilities.[69] Rural Americans have higher rates of chronic illness and poor overall health compared to those living in urban areas.[70] See Table 15-2 in Chapter 15 for specific examples of health disparities among these groups. The Patient Protection and Affordable Care Act of 2010 has several provisions to improve the health of underserved populations, including insurance reform, improved access to health care, cost containment, and public health initiatives.[71]

health disparities Exist when a segment of the population bears a disproportionate incidence of a health condition or illness.

Ethnicity A property of a group that consists of its sharing cultural traditions, having a common linguistic heritage, and originating from the same land.

Center for Disease Control (CDC)

REACH is a national program administered by the Centers for Disease Control and Prevention to reduce racial and ethnic health disparities. Through REACH, recipients plan and carry out local, culturally appropriate programs to address a wide range of health issues among African Americans, American Indians, Hispanics/Latinxs, Asian Americans, Alaska Natives, and Pacific Islanders.

Challenges of the Twenty-First-Century Lifestyle

The WHO describes obesity as "an escalating epidemic" and one of the greatest neglected public health problems of our time. Many factors, including genetics, influence body weight, but excess calorie intake and physical inactivity are the leading causes of overweight and obesity and represent the best opportunities for prevention and treatment. Consider how the following lifestyle trends have either increased opportunities for poor nutrition (particularly excess calories) or decreased opportunities for physical activity:[72]

- Food portion sizes and obesity rates have grown in parallel. In the 1960s, an average fast-food meal of a hamburger, fries, and a 12-ounce cola provided 590 calories; today, many super-sized, "extra-value" fast-food meals deliver 1,500 calories or more.
- Vending machines selling soft drinks, high-fat snacks, and sweet snacks are common on college campuses and in workplaces. Milk, juices, water, and healthful snacks are far less accessible than their unhealthful counterparts.
- Both adults and children spend more time in sedentary activities, such as watching television, sitting at the computer, or commuting to and from work and school, and schools offer fewer physical education classes for children.
- Increasing numbers of families live in communities designed for car use that are unsuitable (lack of green space for recreation) and are often unsafe (lack of sidewalks, inadequate street lighting) for activities such as walking, biking, and running.

No doubt the causes of obesity are complex, and many causes may contribute to the problem in a single person. Given this complexity, it is obvious that there is no panacea for successful weight management. See Chapter 8 for a detailed discussion of the obesity epidemic and descriptions of current public health policies, as well as proposed policies and legislation to prevent obesity and overweight.

Global Environmental Challenges for Public Health

Many global environmental indicators affecting public health are now deteriorating.[73] These include climate change, depletion and degradation of topsoil, accelerated loss of species and of fresh water and sources of energy, and increased use of and persistence of many chemical pollutants. Recent and current modes of food production have made major contributions to these adverse environmental changes.[74] A diverse group of international scholars and food and nutrition experts have come together to work on a project titled New Nutrition Science; they argue that the field of nutrition—and particularly public health nutrition practice because of its work in developing food and nutrition policies—is necessarily involved with these environmental challenges facing the world.[75] Additional challenges exist as well. The Food and Agriculture Organization of the United Nations estimates that at least 820 million people suffer from chronic undernutrition, consuming too little food each day to meet even minimum energy requirements.[76] New epidemics of obesity, diabetes, and other chronic diseases including heart disease, osteoporosis, and certain types of cancer are now prevalent in both developed and developing countries and among high-, middle-, and low-income populations and communities. These diseases, all of which are related to nutrition, impose an enormous burden on today's health-care systems. The nutrition field can successfully address these challenges, but it can do so only by means of an integrated biological, social, and environmental approach (see the box that follows).

"How food is grown, processed, distributed, sold, prepared, cooked, and consumed is crucial to its quality and to its effect on well-being and health, society, and the environment."[77] The concepts of **sustainability** and **sustainable food systems** are gaining mainstream attention—with numerous groups encouraging consumers to increase their awareness of sustainability issues and how these apply to food systems and the health of

Sustainability The capacity of being maintained over the long term in order to meet the needs of the present without jeopardizing the ability of future generations to meet their needs.

Sustainable food systems When production, processing, distribution, and consumption are integrated and related practices that regenerate rather than degrade natural resources, are socially just and accessible, and support the development of local communities and economies.