

Index*

A

Abdominal distension, 467t

Abdominal pain, 467t

Absenteeism, disability and, 259, 271, 273f, 273t, 281a

Acarbose, for diabetes mellitus, 533

Accident(s), mortality from, in IDDM, 227, 227f

Acculturation, NIDDM risk and, 195, 195t

in Hispanic Americans, 640–641, 641t

Acetaminophen, ESRD risk in diabetics and, 366, 367t

Achondroplasia, secondary diabetes with, 70t

Acidosis, hospitalization rates for, 285t

Acromegaly

causes, 74

malignancy and, 74

mortality rate in, 74

prevalence, 74

secondary diabetes with, 70t, 74–75

treatment, 74

ACTH, diabetogenic effects, 70t

Activities of daily living. See also Instrumental activities of daily living

disability and, 275–276, 276f, 276t

limitations, in diabetics, 5, 263–265, 265f, 266

versus nondiabetic populations, 259

Activity level. See also Exercise; Physical activity

IDDM mortality risk and, 229

as risk factor

for NIDDM, 191–193, 192t, 196

in North American Indians, 688

Activity limitation(s)

in diabetes, 263f, 263–265, 264f,

264t, 265f, 281a

time trends in, 271, 271t

disability and, 275–276, 276f, 276t

in IDDM, late complications of diabetes and, 270, 270f, 270t

in NIDDM, late complications of diabetes and, 270, 270t

prevalence

in diabetic versus nondiabetic populations, 267, 268f

by sex, age, and diabetes status, 281a

by type of activity, sex, age, and diabetes status, 281a

ADA. See American Diabetes Association (ADA)

Addison's disease, 76

Adenosine deaminase gene

chromosomal location, 187t

diabetes and, 180, 186t

mutations, diabetes secondary to, 78t

Adjuvant therapy, for complications of diabetes mellitus, 533–534

ADL. See Activities of daily living

α -Adrenergic agonists, diabetogenic effects, 70t

β -Adrenergic blockers

diabetogenic effects, 70t, 77, 77t

effects on progression of diabetic nephropathy, 369

sites of action, 77t

African Americans. See also Caribbean populations

amputation rate among, 622

atypical diabetic syndromes in, 620

cardiovascular disease in, 622

complications in, 12, 613, 621–622

risk factors for, 622–623

diabetes in, 613–630

in children, 11–12

incidence, 613

prevalence, 11–12, 51f, 51–52, 52f,

52t, 65a, 66a, 613, 616t, 616–

618, 617t

research needs, 625

time trends in, 618

with diabetic ketoacidosis and HLA genes associated with IDDM, NIDDM in, 181

diagnosed diabetes in prevalence, 63a, 617t

three-year average number of, 1979–92, 66a

disability in, 269, 269f

dyslipidemia in, 623, 624f

end-stage renal disease in, 621

survival, 621

gestational diabetes in, risk factors for, 621

historical origins, 614, 614f

hypertension in

NIDDM and, 623t

theory, 623

IDDM in, 11–12

autoimmunity and, 616

HLA associations, 168, 615–616

incidence, 1, 37, 40, 42f, 166, 664

ketosis in, 616

prevalence, 616t, 616f, 616–618

risk, in relatives, 167

risk factors for, 615–616

impaired glucose tolerance in

NIDDM and, 620

prevalence, 617t

mortality among, 624–625

death certificate data, 624, 624f

by diabetes status, 625

nephropathy in, 621–622

NIDDM in

incidence, 54, 618

prevalence, 1

risk factors for, 619–620

smoking and, 622–623, 623t

susceptibility, thrifty gene hypothesis, 619

undiagnosed, 12, 23t

obesity in

by diabetes status, 619t

NIDDM and, 619

as percent of nondiabetic population,

* Page numbers followed by t, f, and a indicate tables, figures and appendices.

- 29f
 percent screened for diabetes, 29t
 psychosocial factors, severity of complications and, 623
 racial admixture, childhood diabetes risk and, 615
 retinopathy in, 621, 621f
 socioeconomic status
 diabetes and, 619–620
 severity of complications and, 622
 stroke in, risk, 449, 452, 452t
 blood glucose levels and, 454
 undiagnosed diabetes in, 12, 23t
 prevalence, 617t
- Africans, in Trinidad, diabetes in, 670–671**
- Age**
 alcohol consumption and, by diabetes status, sex, and race/ethnicity, 159a
 blood glucose testing and, 138a
 blood pressure and, by diabetes status, 146a
 body mass index and
 by diabetes status, 141a
 measured and self-reported, 144a
 by sex, race/ethnicity, and diabetes status, 141a
 by sex and diabetes status, 141a
 diabetes as underlying cause of death with, 247, 247f, 248f, 249, 249t, 250
 diabetes status and, with parental history of diabetes, by sex and race/ethnicity, 139a–140a
 diabetic retinopathy risk and, 309–310, 310f, 310t, 311t
 disability and, 259
 exercise participation and, by diabetes status, 160a
 family history of diabetes and, diabetes status and, 217a, 218a
 fasting triglycerides and, by diabetes status, 153a, 154a, 156a
 HDL cholesterol and, by diabetes status, 154a, 155a
 health status and, by diabetes status, 160a
 heart disease risk and, 438–439
 hypertension and
 antihypertensive treatment for, 150a
 by diabetes status and sex, 147a
 measured and self-reported, by diabetes status, 148a
 in NIDDM, by race/ethnicity, 146a
 LDL cholesterol and, by diabetes status, 153a, 155a
 mean fasting triglycerides and, by diabetes status, 151a
 mean HDL cholesterol and, by diabetes status, 151a, 152a
 mean LDL cholesterol and, by diabetes status, 150a, 152a
 mean total cholesterol and, by diabetes status, 150a, 151a
 NIDDM and, 181, 181f
 prevalence, by obesity level and sex, 220a
 obesity and, in NIDDM, 143a
 plasma glucose and
 by sex, race/ethnicity, and diabetes status, 137a
 by sex and race/ethnicity, 134a–135a
 smoking and, by diabetes status, 158a
 total cholesterol and, by diabetes status, 153a, 154a, 155a
 2-hour post-challenge plasma glucose and, by sex and race/ethnicity, 135a–136a
 urine glucose testing and, 137a
 urine ketone testing and, 138a
 vision disorders and, 301t, 301–302, 302f
- Age at diagnosis**
 diabetic retinopathy and, 313
 IDDM mortality and, 229, 230f
 mean, in IDDM, 85, 105a
 by population group, in U.S., 90, 90f, 104a, 105a
- Age distribution**
 of diabetic adults, 87f, 87–88, 88f, 102a–103a
 comparisons with 1979–81, 99
 of hypertension, by sex, race, and diabetes status, 124–127, 125f, 126f, 146a, 147a–148a
 of impaired glucose tolerance, 55
 of NIDDM, 53, 53f, 53t, 54f
- Alameda County, CA, coronary heart disease data, 435, 436t**
- Alanine aminotransferase, in diabetic patients, 469–470**
- Alaska natives**
 diabetic end-stage renal disease in, 690
 NIDDM in
 mortality from, 689t, 689–690
 prevalence, 13, 686t
 stroke in, 692
- Albumin, urinary excretion**
 correlation with glycohemoglobin and creatinine clearance, 526–527
 correlation with retinopathy, 527
 elevated. *See* Albuminuria
 normal, 354
- Albumin-to-creatinine ratio, 349**
- Albuminuria**
 antihypertensive therapy and, 369, 369f
 in diabetes, 6–7, 354–358
 prevalence, 349, 354t, 354–355, 355f, 355t
 selective glomerular permeability and, 353–354
 in diabetic glomerulosclerosis, 350
 in IDDM, cumulative incidence, 356, 357f
 incidence, 356f, 356–357, 357f
 NIDDM and, 197, 252, 354
 quantification, 349
 as risk factor for death, 357–358
 as risk marker for NIDDM mortality, 252
- Alcohol**
 consumption
 diabetic retinopathy and, 320
 in diabetic versus nondiabetic persons, 118, 129, 159a
 NIDDM and, 3, 191, 196
 glycemic effects, 525
- Aldose reductase inhibition, renoprotective effects, 375**
- Aleuts, diabetes prevalence in, 686t**
- Algonquin Indians, diabetes prevalence in, 686t**
- Allegheny County, PA, IDDM in distribution**
 by age, 88, 88f, 102a
 by age at diagnosis, 90, 90f
 by age at onset, 104a
 by duration of diabetes, 104a
 by duration of disease, 89, 89f
 incidence, 39, 40
 by age at onset, 42f
 annual sex-race specific, 42t
 in children, 166
 epidemic pattern, 44f
 by month of year, 42, 42f
 by race, age, and sex, 166, 166f
 by race, sex, and year, 43f
 seasonal variation in, by race, 167, 167f

- by sex, 43, 43*t*
- temporal variation in, 43*f*, 44*f*
- mortality from, in DERI cohort, 223, 223*f*, 225, 225*f*, 227, 227*f*, 229*f*, 229–230, 230*f*
- prevalence study, 39*t*
- Alprazolam, side effects, in adult diabetic populations, 514, 515*t***
- Alstr{uml}om syndrome, secondary diabetes with, 70*t***
- Ambulatory care visits, 541–552**
 - characteristics, 548–549
 - counseling services in, 549, 550*t*
 - diagnostic services in, 549, 550*t*
 - duration, 548, 549*t*, 549*f*
 - mean, 548, 549*t*
 - trend in, 548–549, 549*t*
 - frequency, 547
 - to regular physician, 547, 547*t*
 - by type of diabetes, 547, 547*f*
 - interval since last, number of persons with diabetes by, 546*t*, 547
 - national surveys and data sources, 541–543
 - number, 542*t*, 543
 - by age, 552*a*
 - by race, 552*a*
 - by sex, 552*a*
 - payment for, expected sources, 550, 550*t*
 - rate
 - for all persons, 544, 544*f*
 - per person with diabetes, 543*t*, 543–544, 544, 544*f*
 - return, for care of 10 most frequent diagnoses associated with primary complaint, 545–546, 546*t*
 - sources, 543–544
 - to specialists, 548*f*, 548–549
 - by specialty, 548*t*, 548–549, 549*f*
 - in which diabetes was diagnosis most associated with patient's primary complaint, 544–545, 545*t*
 - in which diabetes was listed as diagnosis, versus all diagnoses, 545, 545*t*
- Ambulatory medical care, 541–552.**
 - See also Ambulatory care visits**
 - characteristics, 552*a*
 - for diabetes, 10
 - patient clinical characteristics, 552*a*
 - patient demographic characteristics, 552*a*
- American Association of Diabetes Educators, 583**
- American Diabetes Association (ADA), 583**
 - 1992 cost study, 607
 - comparison with other studies, 607
 - diagnostic criteria for diabetes, 50–51
- American Dietetic Association, geriatric curricula, 583**
- American Samoa**
 - adiposity in, 675
 - diabetes mortality rate in, 675
 - modernization, 675
- Americans with Disabilities Act, 260, 274**
- Amerindian admixture, in Hispanic Americans, NIDDM and, 642*f*, 642*t*, 642–643**
- Amoxapine, side effects, in adult diabetic populations, 514, 515*t***
- Amputation. See Lower extremity amputation**
- Amylin. See Islet amyloid polypeptide (amylin)**
- Anatomical factors, in diabetes, infection risk and, 485–486**
- Anemia, with glucagonoma, 76**
- Angina, diabetes and, prevalence by type of diabetes, insulin use, and age, 430, 430*t***
- Angiography, in lower extremity arterial disease, 402**
- Angiotensin converting enzyme gene, diabetic nephropathy and, 362**
- Angiotensin converting enzyme inhibitors**
 - effects
 - on diabetic nephropathy, 369–370, 370*t*
 - on protein excretion, 369–370, 370*t*
 - mechanism of action, 370
 - for microproteinuria/macroproteinuria, 534
 - renoprotective effects, 349
- Anglos with NIDDM**
 - female
 - HDL cholesterol levels, 131, 164*a*
 - LDL cholesterol levels, 131, 164*a*
 - serum triglyceride levels, 131, 164*a*
 - metabolic characteristics, by sex, community-based studies, 130–132, 162*a*
- Ankle/arm index. See Ankle-brachial index**
- Ankle-brachial index**
 - low, foot ulcer risk and, 413, 413*t*
 - in lower extremity arterial disease, 402
 - measurement, 402
- Ankle jerk reflex, changes, by diabetes status, 344*f*, 345, 345*f***
- Anorexia nervosa, in adult diabetic population**
 - prevalence, 507, 509–511
 - sex distribution, 511
 - signs and symptoms, 509
- Anticonvulsants, diabetogenic effects, 70*t***
- Antidepressant therapy, in adult diabetic populations, 514, 515*t***
 - efficacy, 507
 - side effects, 514, 515*t*
- Antihypertensive therapy**
 - agents, diabetogenic effects, 70*t*
 - albuminuria and, 369, 369*f*
 - blood pressure control with, 369, 369*f*
 - diabetic nephropathy and, 369*f*, 369–370, 370*t*
 - glomerular filtration rate and, 369, 369*f*
 - in NIDDM, 117, 127, 127*f*, 150*a*
- Antineoplastic agents, diabetogenic effects, 70*t***
- Antiprotozoal agents, diabetogenic effects, 70*t***
- Antisocial personality, in adult diabetic population, 511*t*, 512**
- Anxiety, in adult diabetic population, 507, 511*t*, 512**
- Aortic arch, dilatation, in NIDDM, at diagnosis, 18**
- Aortic calcifications, in NIDDM, at diagnosis, 18**
- Apache Indians, diabetes in, prevalence, 685*t***
- Aphakia, 323, 325*t***
- Apolipoprotein(s)**
 - A-I gene, chromosomal location, 187*t*
 - A-II gene, chromosomal location, 187*t*
 - A-IV cluster gene, chromosomal location, 187*t*
 - B
 - gene, chromosomal location, 187*t*
 - signal peptide-length variation, in Hispanic Americans, NIDDM and, 643
 - C-III gene, chromosomal location, 187*t*
 - D gene, chromosomal location, 187*t*
- Appetite suppression, for refractory morbid obesity, in NIDDM, 524**
- Arapaho Indians, diabetes prevalence**

in, 685t

Arizona, Native Americans in
 diabetic, metabolic characteristics, by sex, in Strong Heart Study, 130–132, 163a
 women with NIDDM
 HDL cholesterol levels, 131, 164a
 LDL cholesterol levels, 131, 164a
 serum triglyceride levels, 131, 164a

Arterial insufficiency. See also Lower extremity arterial disease (LEAD)
 foot ulcers and, 413

Arteriosclerosis obliterans. See also Pulse deficits
 definition, 417
 in lower extremity arterial disease, lower extremity amputation risk and, 417–418

Aseptic meningitis, IDDM and, 43, 44f

Asia, IDDM incidence in, 165

Asian Americans
 definition, 662
 demographics, 662–663
 diabetes in, 12–13, 661–681
 ethnic categories, 662
 ethnic distribution, 662t, 662–663
 time trends in, 662–663, 663t
 ethnic origins, 662f
 foreign-born, 663
 geographic distribution, 663, 664t
 in Hawaii, 665
 IDDM in, 663–664
 incidence, 664
 NIDDM in, 12, 665–668
 lifestyle factors and, 12–13
 undiagnosed, 12

Asian Indians
 central obesity and insulin resistance among, 671
 diabetes in, 668
 in Cape Town area of South Africa, 670
 in Coventry, England, 671, 671f
 in Fiji islands, 670
 prevalence, 665f, 670
 in Singapore, 669t
 in Southall, England, 670f, 671
 geographic distribution, 663, 664t
 in Trinidad, diabetes in, 670–671

Asians. See also Pacific Islanders
 diabetes in
 in migrant populations in other countries, 668–671
 in native versus migrant popula-

tions, 664–665
 reduction in physical activity and, 676
 end-stage renal disease in, 360, 361t
 gestational diabetes in, 709, 709t
 mortality, from stroke, 449, 449t
 with NIDDM, 664–674
 end-stage renal disease in, 361
 percent screened for diabetes, 29t

HL-Asparaginase, diabetogenic effects, 70t

Aspirin
 ESRD risk in diabetes and, 366, 367t
 in stroke prevention, 455
 vision disorders and, 321

Assiniboine Indians, diabetes prevalence in, 685t

Association studies
 advantages and disadvantages, 184
 interpretation, 184
 in NIDDM, 184t–185t, 184–185

Ataxia-telangiectasia, secondary diabetes with, 70t

Atherosclerosis
 dyslipidemia of diabetic renal disease and, 367
 of extremity, hospital discharge data for, 404t
 factors promoting, 196–197
 prevalence, in diabetic and nondiabetic men, autopsy studies, 434, 434f
 risk factors for, 196–197
 stroke risk and, 449

Atherosclerosis Risk in the Community Study, 453f, 454

Atomic Bomb Casualty Commission, 666

Atypical diabetic syndromes
 in African Americans, 620
 IDDM without HLA associations, 620
 ketosis-resistant with phasic insulin dependence, associated with malnutrition, 620

Auckland, New Zealand, IDDM incidence, temporal variation in, 44f

Austria, IDDM incidence, temporal variation in, 44f

Autonomic neuropathy
 bowel disturbances in diabetes and, 467t, 468
 in diabetes, 340, 340t, 346t, 347
 prevalence, 341, 341f, 342
 diabetic renal disease and, 364
 foot ulcers and, 412–413

B

Bacteremia
 average annual frequency, in hospital discharge summaries, 490t
 in diabetes, 493
 microbiology, 493
 mortality, 493
 in hospitalized patients, 493

Bacteriuria, asymptomatic
 definition, 486
 in diabetic patients, 7, 9, 375, 375t, 376t, 486, 486t, 487

Bannock Indians, diabetes prevalence in, 685t

Barbados, IDDM incidence in, 615

Bardet-Biedl syndrome, 80
 secondary diabetes with, 70t, 80

Beaver Dam, WI
 disability data from, 277, 278
 eye study
 cataract data, 323, 324t, 325t
 corneal disease data, 328
 glaucoma data, 326, 327t

Beck Depression Inventory scores, correlation with glycosylated hemoglobin and symptom reporting, 513, 513t

Bedtime insulin/daytime sulfonylurea (BIDS), 521

Behavioral factors
 assessment, 189–190
 NIDDM and, 189–196
 in Hispanic Americans, 640–641

Beijing, China, diabetes in, 672

Bezoars, dietary fiber and, in diabetes mellitus, 525

BIDS (bedtime insulin/daytime sulfonylurea), 521

Birth certificate data
 on prevalence of diabetes in pregnancy, 720, 721–722, 722f
 reporting of diabetes, 621f

Birth order, IDDM risk in offspring and, 172

Birth weight
 high. *See also* Macrosomia
 in pregestational diabetic pregnancies, 726f, 726–727
 low, diabetes risk and, 194

Blackfeet Indians, diabetes prevalence in, 685t

Blacks, non-Hispanic. See also African Americans
 alcohol consumption, by diabetes

status, age, and sex, 159a
 blood glucose testing in, 138a
 blood pressure, by diabetes status, 146a
 body mass index
 by duration of NIDDM, age, and sex, 142a
 measured and self-reported, by age and sex, 144a
 by sex, diabetes status, and age, 141a
 with diabetes, sociodemographic characteristics, 85, 89, 89f, 90–91, 93, 95–97, 99, 103a, 104a–116a
 diabetes status, and parental history of diabetes, by age, 139a
 dialysis patients, survival, 371, 372f
 end-stage renal disease in, 360, 361t
 exercise participation, by diabetes status, 160a
 with family history of diabetes, by diabetes status and age, 216a, 217a, 218a
 fasting triglycerides, by diabetes status, 153a, 154a, 156a
 females with NIDDM
 HDL cholesterol levels, 131, 164a
 LDL cholesterol levels, 131, 164a
 serum triglyceride levels, 131, 164a
 gestational diabetes in, 709, 709t
 HDL cholesterol, by diabetes status, 154a, 155a
 health status, by diabetes status, 160a
 hypertension in
 antihypertensive treatment for, 150a
 by diabetes status and sex, 147a
 measured and self-reported, by diabetes status, 148a
 physician-diagnosed, by age and diabetes status, 149a
 IDDM in
 end-stage renal disease in, 361, 361f
 incidence, age-adjusted, 40, 40t
 LDL cholesterol, by diabetes status, 153a, 155a
 mean fasting triglycerides, by diabetes status, 151a
 mean HDL cholesterol in, by diabetes status, 151a, 152a
 mean LDL cholesterol in, by diabetes status, 150a, 152a
 mean total cholesterol, by diabetes status, 150a, 151a
 mortality in, diabetes as underlying

cause of death for, 247, 247f, 249, 249t, 250
 NIDDM in
 age-standardized prevalence, by percent desirable weight and age, 219a
 end-stage renal disease in, 361, 361f
 and hypertension, by age, 146a
 metabolic characteristics, national and community-based studies, comparison, 130–132, 161a
 prevalence, by family history of diabetes and age, 219a
 retinopathy risk in, 308, 309, 309f
 obesity in, in NIDDM, by age and sex, 143a
 overweight in, by age and sex, 220a
 parity, by diabetes status, age, and sex, 156a–157a, 157a, 158a
 plasma glucose in
 by age and sex, 134a
 by diabetes status, 137a
 smoking and, by diabetes status, age, and sex, 158a
 stroke in
 mortality from, 449, 449t, 450f
 risk, carotid artery intimal-medial wall thickness and, 453f, 454
 subscapular-to-triceps skinfold ratio, by age, sex, and diabetes status, 145a
 total cholesterol, by diabetes status, 153a, 154a, 155a
 2-hour post-challenge plasma glucose in, by age and sex, 136a
 urine glucose testing in, 137a
 urine ketone testing in, 138a
Bladder infection. See also Cystitis
 prevalence, by diabetes status and sex, 488t, 489
Bleeding, gastrointestinal, diabetes and, 464
Blindness/legal blindness
 from all causes, prevalence, 294, 295t
 definition, 294
 diabetes-related, 293
 age-adjusted relative risk for, 294, 294t
 causes, by age and sex, 298, 299t
 diabetic retinopathy and, 297, 298f
 duration of disease and, 296–297, 297f
 economic impact, 303–304
 IDDM mortality risk and, 229
 in IDDM versus NIDDM, 297–298

incidence, 298t, 298–301
 prevalence, 294, 294t
 rehabilitation for, 303–304
 research needs related to, 305
 retinopathy and, 5
 risk factors for, 301–303
Blood glucose. See also Hyperglycemia; Plasma glucose
 community-based studies, 119, 119f, 130, 161a–163a
 control. See Glycemic control
 elevation. See Hyperglycemia
 national data sources, 119–121, 120f, 121f, 134a–136a, 137a, 138a
Blood glucose test(s). See also Fasting plasma glucose; Glucose tolerance, tests; Oral glucose tolerance test(s)
 in diagnosis, 21, 21f, 21t, 22t
 frequency, 15
Blood pressure. See also Hypertension
 by age, sex, race, and diabetes status, 124–127, 125f, 126f, 146a, 147a–148a
 cerebrovascular disease risk and, 451, 452, 452t
 control, diabetic renal disease and, 369f, 369–370, 370t
 diabetic retinopathy and, 318t, 318–319, 319t
 in diabetics, community-based studies, 131, 131f, 161a, 162a, 163a
 IDDM mortality risk and, 228
 NIDDM and
 in Hispanic Americans, 639t, 640, 659a
 in non-Hispanic Americans, 659a
 with undiagnosed NIDDM, 117
Blue Cross-Blue Shield, percentage of cost reimbursed by, decrease in, 550
BMI. See Body mass index
Body fat distribution, NIDDM and, 193, 619
Body mass index, 619
 diabetes risk and, in North American Indians, 687f, 688, 688f
 diabetic retinopathy and, 320
 in diabetics, 673
 community-based studies, 130, 131f
 racial/ethnic distribution, 123, 123f, 141a
 by sex and duration of disease, in non-Hispanic whites, 123,

123*f*, 142*a*
sex distribution, 123, 123*f*, 141*a*
by duration of diabetes, 123, 123*f*,
142*a*
age distribution, 142*a*
racial/ethnic distribution, 142*a*
sex distribution, 142*a*
with IGT, 117, 122*f*, 123, 141*a*
in NIDDM, 3, 117, 122*f*, 122–124,
123*f*, 141*a*
in Hispanic Americans, 639*t*, 640,
659*a*
mean measured and self-reported,
124, 144*a*
in non-Hispanic Americans, 659*a*
with normal glucose tolerance, 117,
122*f*, 122–123, 141*a*
in obesity, 123
in undiagnosed NIDDM, 122*f*, 123,
141*a*, 219*a*

Borderline diabetes, 19

**Bovine serum albumin antibodies
(ABBOS), in childhood IDDM,
171**

**Bowel disturbances, in diabetes,
458*t*–459*t*, 467–468**

Brazil, diabetes in, 669

**Breast-feeding, in prevention or delay
of IDDM, 3, 170–171**

Bronchitis

chronic, in diabetic patients, fre-
quency, 487*t*
in diabetes, 492–493
prevalence, by diabetes status and
sex, 488*t*

Bronze diabetes, 72

**Bulimia nervosa, in adult diabetic
population**

prevalence, 507, 509–511
sex distribution, 511
signs and symptoms, 509–511

C

Canada, diabetes care costs in, 609

Canadian Indians/Canadian Natives

diabetes in
end-stage renal disease in, 690
prevalence, 684, 684*t*
hypertension in, 692
ischemic heart disease in, 692
NIDDM in
mortality from, 689
obesity and, 688
stroke in, 692

**Candida vaginitis, average annual fre-
quency, in hospital discharge
summaries, 490*t***

**Candida vulvovaginitis, in diabetes,
489–491, 490*t***

Candidiasis

oral, in diabetes, 504
urogenital, average annual frequency,
in hospital discharge summaries,
490*t*

**CAPD. See Continuous ambulatory
peritoneal dialysis**

**Cape Town, South Africa, diabetes in,
670**

**Captopril, effects on incidence of re-
nal disease in IDDM patients
with nephropathy, 370, 370*f***

Capture-recapture technique, 38

Carbohydrate metabolism

diet and, 689
oral contraceptive effects on, 77
sex steroid hormone effects on, 77

**Carbohydrates, dietary, NIDDM and,
190, 190*t***

**Carcinoid syndrome, secondary dia-
betes with, 70*t*, 76**

Cardiomyopathy, diabetic

autopsy studies, 434–435
clinical studies, 433–434

Cardiovascular disease

in African Americans, 622
costs, attribution to diabetes, 602
in diabetes, 429
in elderly, 576*t*, 581, 582
hospital discharge data on, 558,
565*a*
hypertension and, 623
in IDDM, mortality from, 4, 221, 222,
222*f*, 225–226, 226*f*
in North American Indians, 692
nutritional therapy and, in diabetes
mellitus, 522–523
risk, insulin-resistant diabetes and,
622
risk factors for, NIDDM mortality
and, 251*f*, 251–252

**Cardiovascular Health Study, 454,
454*f***

**Caribbean populations. See also Afri-
can Americans**

atypical diabetic syndromes in, 620
diabetes prevalence in, 617–618
hypertension in, 623
IDDM in
mortality from, 625

pediatric, 615

Caries, in IDDM, 501

Carotid artery

intimal-medial wall thickness
by diabetes status, 454, 454*f*
stroke risk and, 453*f*, 454
stenosis
by diabetes status, 454, 454*f*
surgery for, in stroke prevention,
455

**Carotid bruits, stroke risk and, by
diabetes status, 453, 453*f***

**Carpal tunnel syndrome, in diabetes,
340, 340*f***

prevalence, 341, 341*f*
Rochester Diabetic Neuropathy Pro-
ject, 341*f*, 341–342

**Carter Center study, cost estimates,
604–607**

disability and mortality productivity
loss, 606
hospital service, 605
nursing home service, 606
physician service, 605

Casein. See Lactoglobulin

Cassava (tapioca), diabetes and, 72

Castleman's disease, 76

Cataracts, 321–326

definition, 293
in diabetes, 293
extraction, 323–326, 325*t*
in NIDDM, 6
in North American Indians, 692
prevalence
by age, 322, 322*f*
by age and diabetes status, 321–
322, 322*f*
by diabetes status, 321–322, 322*f*
risk factors for, 323, 324*t*
as risk marker for NIDDM mortality,
252

Catecholamines

antiinsulin effects, 75
diabetogenic effects, 70*t*, 74*t*
sites of action, 74*t*

Caucasians. See Whites

**CCPD. See Continuous cycling perito-
neal dialysis**

Celiac disease

diabetes and, 457, 468, 468*f*
in IDDM, 8–9

**β-Cell autoimmunity, NIDDM associ-
ated with, 179, 180**

Cellulitis

average annual frequency, in hospital

- discharge summaries, 490t
in diabetes, 490t, 491
of toe, 9
- Central obesity.** *See Obesity, central*
- Cerebral infarction.** *See Stroke*
- Cerebrovascular disease.** *See also Stroke*
in diabetes, 450
mortality from, 242t, 243f
in NIDDM, mortality from, 4, 242t, 243f, 248–249
risk, hypertension and, 451
risk factors, 451
- Cesarean delivery, in pregestational diabetic pregnancy, 13, 729**
- Charcot foot, in diabetes, 410t**
- Charcot joint disease of ankle, 339**
- Chemical agent(s), diabetogenic effects, 70t, 76**
- Chemical diabetes, 19**
- Cherokee**
diabetes prevalence in, 686t
end-stage renal disease in, 690
hypertension in, 692
- Chicago, IL, coronary heart disease data, 435, 436t**
- Children**
African-American, diabetes in
incidence, 615
risk factors for, 615–616
IDDM in
incidence, 37, 38f
mortality, risk factors for, 228, 229
NIDDM in, among North American Indians, 693
- Chile, IDDM incidence in, 166**
- China, diabetes prevalence in, 672, 672t**
- Chinese**
diabetes in
among elderly, 673
mortality from, 668, 668f, 670
prevalence, 665f, 667–668, 670
in Singapore, 669t, 670
IDDM in, HLA associations, 168
insulin levels, genetic factors associated with, 188
mortality in, diabetes as underlying cause of death for, 249, 249t
- Chippewa Indians**
diabetes prevalence in, 685t, 686t
diabetic end-stage renal disease in, 690
foot ulcers in, 413, 413t, 691
lower extremity amputation rate, 691
- Chlorthalidone, diabetogenic effects, 70t, 77**
- Choctaw Indians**
diabetes prevalence in, 686t
NIDDM in, genetics, 687
- Cholecystectomy.** *See Gallbladder operation (cholecystectomy)*
- Cholesterol**
dietary intake, diabetes mellitus and, 519, 524
levels, with NIDDM, by race, 623, 624f
mean total, in NIDDM, in Hispanic and non-Hispanic Americans, 659a
serum. *See also* High-density lipoprotein(s); Low-density lipoprotein(s)
by age, sex, race/ethnicity, and diabetes status, 127–128, 128f, 150a, 151a
cerebrovascular disease risk and, 451
community-based studies, 131, 132f, 161a, 162a, 163a
diabetic renal disease and, 364, 364t
elevated, NIDDM mortality and, 251
lower extremity amputation risk and, 417t, 418
management, in stroke prevention, 455
in NIDDM, 3, 118
total serum
abnormalities, by age, sex, race/ethnicity, and diabetes status, 128, 153a, 154a, 155a
in NIDDM, in Hispanic and non-Hispanic Americans, 659a
- Chromium, dietary, for hyperglycemia, 525**
- Chromosomal defects, secondary diabetes with, 70t**
- Chromosome 20q, markers, in MODY, 180**
- Cigarette smoking**
in African Americans, with NIDDM, 622–623, 623t
by age, sex, race/ethnicity, and diabetes status, 129, 129f, 158a, 159a
cessation, in stroke prevention, 455
diabetic renal disease and, 365–366, 366t
diabetic retinopathy and, 313t, 320
foot ulcer risk and, 413, 413t
in IDDM, mortality and, 4, 228
lower extremity amputation risk and, 417t, 417–418
in NIDDM, 3
mortality and, 251
prevalence, in diabetic versus nondiabetic persons, 118
stroke risk with, 8, 449, 451
in undiagnosed NIDDM, 24
- Cirrhosis**
in hemochromatosis, 73
hepatic, diabetes and, 470
- Classification, 613–614**
- Clinical presentation, of diabetes, psychological factors affecting, 512–514**
- Clinical studies, of diabetic patients, methodological problems in, 430**
- Clonidine, diabetogenic effects, 70t**
- Coccidioidomycosis, in North American Indians, 691**
- Cockayne's syndrome, secondary diabetes with, 70t**
- Cognitive-behavioral psychotherapy (CBT), in adult diabetic populations, 515**
- Cohabitation type, distribution of diabetic adults by, in U.S., 93, 93f, 94f, 108a**
- Colonization**
definition, 491
in diabetic patients, lower extremity skin infection and, 491
- Colorado**
Hispanics in, diabetes prevalence in, 633, 634f, 634t
IDDM incidence
by sex, 43t
time trends in, 43f, 44f
IDDM prevalence study, 39t
- Colorado IDDM Registry, data on IDDM in Hispanics, 643–644, 644f, 644t**
- Colville Indians, diabetes prevalence in, 686t**
- Coma.** *See also Diabetic coma; Hyperosmolar nonketotic coma*
hypoglycemic
hospitalization rates for, 5, 285t
incidence, 289, 290t
- Comorbid conditions**
costs, 601
attribution to diabetes, 602
in NIDDM, 527
- Complications of diabetes, 4–9, 17**

- acute, in IDDM, mortality from, 227, 227*f*, 229, 230*f*
- adjuvant therapy for, 533–534
- in African Americans, 613, 621–622
- diagnosis, delay in, and risk of morbidity and disability, 622
- disability and, 259, 267
- fasting plasma glucose as predictor, 18, 19, 27
- glycosylated hemoglobin as predictor, 19, 27
- in Hispanic Americans, health insurance and, 655, 655*f*
- interventions for, 622, 622*t*
- late, disability and, 270, 270*f*, 270*t*
- metabolic, acute, 283–291
- microvascular, 526, 526*f*, 527*f*
- fasting plasma glucose as predictor, 18
- in NIDDM, at diagnosis, 17–18
- oral, 9, 501–504. *See also* Periodontal disease
- risk factors for, 622*t*
- in African Americans, 622–623
- treatment, delay in, and risk of morbidity and disability, 622
- Congenital malformation(s)**
- in diabetic pregnancy, 719, 725*t*, 725–726
- preconceptional care and, 725–726, 726*t*
- in infants of diabetic mothers, in North American Indians, 693
- perinatal mortality and, in diabetic and nondiabetic pregnancies, 724, 724*f*
- Congenital rubella syndrome (CRS), IDDM incidence and, 172**
- Congestive heart failure, diabetes and, clinical studies, 432–433**
- Conn's syndrome, 75**
- Constipation, in diabetes, 8–9, 458t–459t, 467t, 467–468**
- alternating with diarrhea, 467*t*
- Continuous ambulatory peritoneal dialysis. *See also* Peritoneal dialysis**
- cause-specific death rates for, by age, race, and diabetes status, 372, 374*t*
- death rates (1989–91) for patients not yet transplanted, by age, race, and primary disease, 393a
- Continuous cycling peritoneal dialysis. *See also* Peritoneal dialysis**
- annual death rates (1989–91) for patients not yet transplanted, by age, race, and primary disease, 393a
- cause-specific death rates for, by age, race, and diabetes status, 372, 374*t*
- Copenhagen City Heart Study, stroke risk data, by diabetes and carotid bruit status, 453, 453*f***
- Coping style(s), effects on glucose regulation with stress, 512**
- Corneal disease, in diabetes, 293, 328**
- research needs, 328
- Coronary artery disease**
- in diabetes, 8
- incidence, 8
- prevalence, community-based studies, 431–432, 432*t*, 433*f*
- in diabetic versus nondiabetic populations, 435, 435*f*, 435*t*, 436*t*
- excess risk, in diabetic versus nondiabetic persons, 8
- in Hispanic Americans, 646, 647*t*, 648*t*
- in NIDDM, at diagnosis, 17–18
- in Pima Indians, 692
- renal disease and, in IDDM, 226
- Corpus Christi Heart Project, data on reinfarction risk and death after acute MI, 436, 437*t***
- Cost-benefit analyses, cost estimate methods for, 603**
- Cost-effectiveness analyses, cost estimate methods for, 603**
- Costs. *See also* Economic impact**
- attributing, method for, 602
- in Canada, 609
- of comorbid conditions, 601
- attribution to diabetes, 602
- for diabetic persons, 607–609, 608*t*
- components, 607
- versus general population, 608, 608*t*
- versus nondiabetic persons, 601
- versus persons with diabetes or high blood sugar, 608–609, 609*t*
- direct, 601, 604–606, 607
- components, 604–605
- international comparison, 609
- in U.S., 604*t*
- estimation
- etiologic fraction method, 602
- methodological issues in, 602–604
- with population-based surveys, 603–604
- in France, 609–610
- government perspective on, 610
- of health insurance, 598
- individuals' out-of-pocket expenses, 598
- indirect, 601, 604–605, 606–607, 607
- components, 605
- international comparisons, 609–610
- lifetime, estimation, 603
- presentation
- incidence-based, 603
- prevalence-based, 603
- in Sweden, 609
- in U.S., 604*t*, 606–607, 607*t*
- Costs [term], use, 605**
- Counterregulatory hormones**
- diabetogenic effects, 74, 74*t*
- sites of action, 74, 74*t*
- Coventry, England, diabetes in, 671, 671*f***
- Cow's milk, in infant nutrition, IDDM incidence and, 3, 170–171**
- Coxsackievirus infection, IDDM incidence and, 172**
- in Birmingham, AL, 43
- C-peptide status**
- diabetic retinopathy and, 317, 317*t*
- NIDDM and, in Hispanic Americans, 640, 640*t*
- Cree Indians**
- diabetes prevalence in, 686*t*
- hypertension in, 692
- Crow-Fukase syndrome. *See* POEMS syndrome**
- Crow Indians, diabetes prevalence in, 685*t***
- Cuban Americans**
- blood pressure, by diabetes status, 146a
- body mass index
- by duration of NIDDM, 142a
- measured and self-reported, by age and sex, 144a
- by sex, diabetes status, and age, 141a
- diabetes prevalence in, 12, 631
- fasting triglycerides, by diabetes status, 153a, 154a, 156a
- HDL cholesterol, by diabetes status, 154a, 155a
- hypertension in, by diabetes status and sex, 147a–148a
- LDL cholesterol, by diabetes status, 153a, 155a

mean fasting triglycerides, by diabetes status, 151a

mean HDL cholesterol in, by diabetes status, 151a, 152a

mean LDL cholesterol in, by diabetes status, 150a, 152a

mean total cholesterol, by diabetes status, 150a, 151a

NIDDM in

- HHANES data, 635, 635*t*, 636*f*
- and hypertension, by age, 146a
- obesity in, by age and sex, 143a

plasma glucose in

- by age and sex, 135a
- by diabetes status, 137a

subscapular-to-triceps skinfold ratio, by sex and diabetes status, 145a

total cholesterol, by diabetes status, 153a, 154a, 155a

2-hour post-challenge plasma glucose in, by age and sex, 136a

Cushing's syndrome

- glucose intolerance with, 75
- secondary diabetes with, 70*t*, 75

Cutaneous circulation, lower extremity amputation risk and, 417, 417*t*

CVD. See Cardiovascular disease

Cyanide, dietary, tropical malnutrition diabetes and, 72

Cyclosporin

- diabetogenic effects, 70*t*, 77*t*, 78
- sites of action, 77*t*

Cystic fibrosis, secondary diabetes with, 70*t*, 71

Cystitis

- candidal, in diabetes, 491
- in diabetic patients, 486, 487–489
- emphysematous
 - in diabetic patients, 486–487
 - prevalence, by diabetes status and sex, 489
- prevalence, by diabetes status and sex, 488*t*, 489

Cytomegalovirus genome positivity

- IDDM incidence and, 172
- islet cell antibodies and, 172

D

DCCT. See Diabetes Control and Complications Trial

Death certificate(s)

- model (standard), 234, 235*f*
- reporting of diabetes, 624

Death certificate data, 234

- cause-of-death, 234
- for diabetes mortality, 50, 237
- limitations, 233, 234, 237
- for IDDM mortality
 - limitations, 226
 - from 1950 to 1988, 224, 225*f*
- limitations, 234
- reliability, 234, 243
- validity, 234, 243

Death rates. See Mortality

Deferoxamine iron chelation therapy, in hemochromatosis, 74

Demographic characteristics. See also

Total population

- of ambulatory medical care patients, 552a
- of Asian Americans, 662–663
- of diabetic adults, 87–89
- health insurance and, 593, 594*t*
- of nursing home residents, 573–575, 574*t*
- of Pacific Islander Americans, 662–663
- of persons with NIDDM, 2

Dental care, health insurance coverage for, percent of diabetic persons with, 595, 595*f*

Depression, in adult diabetic population, 9, 512

- contributing factors, 507
- correlation with symptom reporting, 513, 513*t*
- disease severity and, 513–514, 514*t*
- pharmacotherapy, 514, 515*t*
- prevalence, 283, 508*t*, 508–509, 509*t*, 510*t*
- methodological issues, 509, 510*t*
- psychotherapy for, 515

Diabetes Control and Complications

Trial (DCCT) data, 519, 526*f*, 526–527, 527*f*

- on albuminuria in IDDM patients, 368, 368*f*
- on benefits of glycemic control, 406–407
- on control of complications in IDDM, 25
- on control of retinopathy in IDDM, 5–6, 25
- on glycemic control and cardioprotective effects, 429
- on hypoglycemia incidence, 283, 289
- on neuropathy control, 6
- on neuropathy prevalence, 345–346,

346*f*

- on risk reduction in incidence and progression of retinopathy, 316*t*, 316–317

- on vision disorders, 293

Diabetes Epidemiology Research International Group (DERI), 38

- IDDM mortality
 - in Allegheny County, PA IDDM cohort, 223, 223*f*, 225, 225*f*, 227, 227*f*, 229*f*, 229–230, 230*f*
- classification, 227, 227*f*

Diabetes in Early Pregnancy Study, 723

Diabetes mellitus

- as any listed cause of death, 248, 248*f*, 250, 250*f*, 257a
- characteristics, by population groups, in U.S., 89*f*, 89–90, 90*f*, 104a, 105a
- classification, 16*t*, 16–17
- diagnosed. *See* Diagnosed diabetes
- in elderly
 - clinical implications, 581
 - complications, 581
 - diagnosis, 581
 - therapy for, 582
- heterogeneity, 2, 15, 16, 16*t*, 17, 78
- insulin-dependent. *See* Insulin-dependent diabetes mellitus (IDDM)
- newly diagnosed
 - age distribution, three-year average number per 1,000 population, 1980–92, 67a
 - average annual number of, 1935–92, 67a
 - racial distribution, three-year average number per 1,000 population, 1980–92, 67a
 - sex distribution, three-year average number per 1,000 population, 1980–92, 67a
 - three-year average number per 1,000 population, 1980–92, 67a
- non-insulin-dependent. *See* Non-insulin-dependent diabetes mellitus (NIDDM)
- secondary. *See* Secondary diabetes therapy for. *See* Insulin therapy; Nutritional therapy; Oral hypoglycemic agents; Therapy
- types, 1, 15, 16–17
- as underlying cause of death, 242*t*,

- 243*f*, 247*f*, 247–248, 248*f*, 249, 249*t*, 250, 256*a*
- undiagnosed. *See also* Non-insulin-dependent diabetes mellitus, undiagnosed
- in African Americans, 12, 23*t*, 617*t*
- diagnostic criteria, 118
- prevalence, 87, 450, 617*t*
- Diabetes Quality of Life (DQOL), 277, 278**
- Diabetic coma**
- hospitalization rates for, 5, 285*t*, 286, 286*t*
- mortality in, 221, 222
- Diabetic gastropathy. *See* Gastropathy**
- Diabetic glomerulosclerosis, 350–375**
- course, 350, 350*f*
- glomerular hemodynamic function in, 351*f*, 351–352
- pathophysiology, 350*f*, 350–354
- proteinuria in, 350
- Diabetic ketoacidosis, 283–287**
- definition, 284
- diagnostic criteria for, 284
- as discharge diagnosis
- length of hospital stay and, 561, 561*f*
- time trends in, 557*f*, 557–558
- in elderly, 581
- health care costs, 283, 286
- hospitalization rates for, 5, 285*t*, 286, 286*t*
- incidence, 5, 283, 284, 284*f*
- age and, 5
- as initial manifestation of diabetes, 284, 285
- with lactic acidosis, 288
- morbidity and mortality, 283, 286*f*, 286–287, 287*f*
- age differences in, 286*f*, 286–287, 287*f*
- racial differences in, 286–287
- mortality from, 5, 222
- multiple hospitalizations for, reporting, 555
- precipitating factors, 283, 284–285
- prevention, 285
- recurrence, 284
- treatment, 283, 285
- Diabetic nephropathy, 6–7**
- in African Americans, 621–622
- blood pressure control for, in diabetes mellitus, 533–534
- definition, 349
- diabetic retinopathy and, 319–320, 367
- familial clustering, 361–362, 362*f*
- in Hispanic Americans, 650–654, 652*t*
- histology, 352–353
- in IDDM, 690
- natural history, 350, 350*f*
- smoking and, 365–366, 366*t*
- time trends in, 356
- incidence, duration of disease and, 361
- intensive insulin therapy and, in IDDM, 519, 526, 526*f*, 527*f*
- in North American Indians, 689, 690, 690*f*
- nutritional therapy and
- in IDDM, 522
- in NIDDM, 522
- pancreatic transplantation and, 533
- pregnancy and, 13, 364–365
- maternal risks with, 719, 728–729
- prevalence, and hyperglycemia and hypertension, 621–622
- risk factors for, 349, 361–366
- Diabetic retinopathy, 305–321**
- in African Americans, 621
- age and, 309–310, 310*f*, 310*t*, 311*t*
- age at diagnosis and, 313
- alcohol consumption and, 320
- blindness due to, 5
- blood pressure and, 318*t*, 318–319, 319*t*
- body mass index and, 320
- clinical characteristics, 293, 305
- co-morbidity and mortality with, 321, 321*f*
- in Hispanic Americans, 650, 651*f*
- in IDDM, 229
- in NIDDM, 252
- control, insulin therapy and, 6
- correlation with urinary albumin excretion, 527
- costs, attribution to diabetes, 602
- C-peptide status and, 317, 317*t*
- detection, 329–330, 330*t*
- diabetic nephropathy and, 319–320, 367
- diagnosis, delay in, and complications, 622
- duration of diabetes and, 311*f*, 311–313, 312*t*
- exogenous insulin and, 318
- genetics, 309
- in Hispanic Americans, 648–650, 649*f*, 649*t*, 650*f*, 650*t*, 651*f*
- HLA associations, 309
- hyperglycemia and, 5, 313*t*, 313–317, 314*t*, 315*t*, 316*t*
- in IDDM, insulin's effects on, 293
- incidence, 5, 306*t*, 307*t*, 307–308, 308*t*
- population-based studies, 305–307, 306*t*, 307*t*
- in WESDR, 308, 308*t*
- intensive insulin therapy and, in IDDM, 519, 526, 526*f*, 527*f*
- lower extremity amputation risk and, 417*t*
- in NIDDM, 5, 24–25
- at diagnosis, 17–18
- in North American Indians, 690, 691*t*
- photocoagulation for, 534
- photocoagulation therapy in, 5–6
- physical activity and, 320
- pregnancy and, 13, 321
- maternal risks with, 719, 727–728
- prevalence, 293
- with diagnosed NIDDM, 621*f*
- population-based studies, 305–307, 306*t*
- in WESDR, 305
- progression, 306*t*, 307*t*, 307–308, 308*t*
- proliferative
- age and, 310–311, 311*f*
- clinical characteristics, 305
- diagnosis, 329–330, 330*t*
- prevalence, 293
- progression to, WESDR data, 314, 316*t*
- proteinuria and, 319–320
- puberty and, 313
- race/ethnicity and, 308–309, 309*f*
- risk factors for, 5, 308–321
- in WESDR, 305
- screening for, cost-effectiveness, 304
- serum lipids and, 313*t*, 320
- sex and, 308
- smoking and, 313*t*, 320
- socioeconomic status and, 320–321
- vitrectomy for, 534
- Diabetic Retinopathy Study (DRS), data on vision disorders, 302, 303*f***
- Diabetogenic hormones, sites of action, 74*t***
- Diagnosed diabetes**
- age distribution, 85
- 1935–81, 64*a*
- 1983–93, 65*a*
- three-year average number of, 1979–92, 66*a*

- racial distribution, three-year average number of, 1979–92, 66a
- sex distribution
- 1935–81, 64a
 - 1983–93, 65a
 - three-year average number of, 1979–92, 66a
- in United States population
- 1935–81, percent, by age and sex, 64a
 - 1983–93, percent, by age and sex, 65a
 - three-year average number of, 1979–92, 66a
- Diagnosis, of diabetes**
- circumstances for, 20f, 20–21, 21t
 - tests for, 21, 21f, 21t, 22t
- Diagnostic criteria, 17–20, 18t**
- for diabetes, 15
 - effects on prevalence statistics, 50–51
 - for gestational diabetes, 19, 19t
 - NDDG versus WHO, 18t, 18–19
 - research needs for, 19
 - scientific basis for, 17–18
- Dialysis. See also Hemodialysis; Peritoneal dialysis**
- economic impact, 373
- Dialysis patients**
- with ESRD attributed to diabetes, death rates for all (1989–91), by cause of death, age, sex, and race, 395a
 - Mexican-American, survival, 631–632
 - not yet transplanted, annual death rates (1989–91) for, by age, race, and primary disease, 392a
 - survival, by cause of renal failure and type of therapy, 371, 372f
- Diarrhea**
- chronic, definition, 466
 - definition, 466
 - in diabetes, 466–467, 467t
 - versus fecal incontinence, 467
 - mechanisms, 466
 - prevalence, 465t, 466, 467t
 - with somatostatinoma, 76
 - sorbitol-induced, 466–467
- Diazoxide**
- diabetogenic effects, 70t, 77, 77t
 - sites of action, 77t
- DIDMOAD syndrome (diabetes insipidus, diabetes mellitus, optic atrophy, sensorineural deafness), 70t, 80**
- Diet. See also Nutritional therapy**
- assessment, methods, 189–190
 - diabetes and, 676
 - diabetic renal disease and, 365, 365f, 365t
 - IDDM and, 170–171
 - low-protein, effects on course of nephropathy in IDDM, 370–371, 371f, 371t
 - NIDDM and, 190–191, 196
 - in Hispanic Americans, 641, 642t
 - as risk factor, in North American Indians, 688–689
- Dietary departments, in nursing homes, 583**
- Dietary therapy, 10**
- Digestive diseases**
- age-standardized prevalence, by diabetes status and sex, 458t–459t
 - age-standardized prevalence ratio, by diabetes status and sex, 458t–459t
 - diabetes and, 8–9, 457–483. *See also* Celiac disease; Constipation; Diarrhea; Fecal incontinence; Gastropathy; Liver disease
 - National Health Interview Survey (NHIS) data on, 457–460, 458t–459t
 - National Hospital Discharge Survey data on, 460–464, 462t–463t
 - national surveys, 457–464
 - NHANES II data on, 460, 461t
 - pathophysiology, 464
 - hospital discharges with, age- and sex-adjusted, by diabetes diagnosis, 462t–463t
 - prevalence, by diabetes status and sex, 458t–459t
- Diphenylhydantoin (Dilantin)**
- diabetogenic effects, 70t, 77, 77t
 - sites of action, 77t
- Disability. See also Activities of daily living; Activity limitation(s)**
- absenteeism and, 271, 273f, 273t, 281a
 - activity limitation(s) and. *See* Activity limitation(s)
 - attributes related to, 267–270
 - chronic conditions and, 265
 - community-based epidemiologic studies, 262, 266t, 266–267, 267f, 267t
 - data on
 - sources, 261–263
 - from U.S. government, limitations, 262 - definition, 260
 - from Old Age, Survivors, and Disability Insurance (OASDI) program, 262 - demographic factors affecting, 259, 267–270, 268f, 268t, 269f, 269t
 - determinants, 260
 - in diabetes, 4–5, 259–282, 261t
 - consequences, 259 - diabetes-related factors in, 259, 270, 270f, 270t
 - discrimination and, 274
 - duration of disease and, 270, 270f
 - economic impact, 259, 272, 275, 275f
 - everyday life and, 271–278
 - framework for, 260
 - health care access and, 275
 - health care use and, 274f, 274t, 274–275
 - health impact, 259
 - health perceptions and, 277, 277f, 277t
 - health preferences and, 278
 - health profiles and, 277–278
 - income and, 275, 275f
 - industrial studies, 262–263
 - late complications of diabetes and, 270, 270f, 270t
 - National Health Interview Survey (NHIS) data on, 261, 263f, 263–265, 264f, 264t, 267, 281a
 - on absenteeism, 273, 281a - National Nursing Home Survey data on, 266
 - occupational. *See* Work disability
 - permanent, productivity lost due to, costs, 606–607
 - physician visits and, 274, 274f
 - prevalence, 263–267
 - age and, 267–268
 - in diabetes, 259, 263–267
 - in United States, 259 - psychologic impact, 272
 - quality of life and, 276, 278
 - Social Security Administration (SSA) data on, 262, 265–266, 271, 271f
 - Social Security Disability Insurance (SSDI) data on, 265–266
 - socioeconomic impact, 259
 - sociologic impact, 272
 - spectrum, 260
 - Survey of Income and Program Participation (SIPP) data on, 261–262, 265, 265f

Survey of Work and Disability data on, 266, 266*f*, 267, 268*t*
time trends in, 271, 271*f*, 271*t*
treatment type and, 270, 270*t*
unemployment and, 272*f*, 272*t*, 272–273

Discrimination, disability and, 274

Distal polyneuropathy, in diabetes, 340, 340*f*
age and, 342*f*, 342–343
glucose tolerance status and, 342*f*, 342–343
prevalence, 341, 341*f*
in San Luis Valley Study, 342*f*, 342–343

Diuretic therapy
diabetogenic effects, 70*t*, 77, 77*t*
effects on progression of diabetic nephropathy, 369
IDDM mortality risk and, 229
sites of action, 77*t*

Divorced persons. See Marital status

DKA. See Diabetic ketoacidosis

Doppler ultrasound, velocimetry, in lower extremity arterial disease, 402

Dorsalis pedis pulse deficit, in diabetic versus nondiabetic populations, 402, 403*t*

Down's syndrome, secondary diabetes with, 70*t*

Drug nephrotoxicity, diabetic renal disease and, 366, 367*t*

Drugs. See also Medication(s)
diabetogenic effects, 70*t*, 76

Duration of diabetes
diabetic retinopathy and, 311*f*, 311–313, 312*t*
disability and, 270, 270*f*
foot ulcer risk with, 413, 413*t*
glaucoma incidence and, 327, 327*f*
heart disease risk with, 438*f*, 438–439
lower extremity amputation risk and, 419
by population group, in U.S., 89–90, 90*f*
as risk factor
for edentulousness, in North American Indians, 691
for lower extremity amputation, in North American Indians, 691
vision disorders and, 301*t*, 301–302, 302*f*

Dyslipidemia
in African Americans, 623, 624*f*

by age, sex, race/ethnicity, and diabetes status, 128, 128*f*, 153*a*, 154*a*, 155*a*, 156*a*
community-based studies, 131, 132*f*, 161*a*, 162*a*, 163*a*
definition, 128
diabetic nephropathy and, 367
diabetic renal disease and, 364
lower extremity amputation risk and, 418
NIDDM and, 3, 197
prevalence, by race, 624*f*
in undiagnosed NIDDM, 24

Dystrophia myotonica, secondary diabetes with, 70*t*

E

Early Treatment Diabetic Retinopathy Study (ETDRS), data on vision disorders, 302, 303*f*, 321

Eating disorder(s), in adult diabetic population
prevalence, 507, 509–511
sex distribution, 511

Economic analysis, evaluation, 601, 602

Economic difficulties, disability and, 259, 272, 275, 275*f*

Economic impact, 601–611. See also Costs
of diabetes, 11
of diabetes-related blindness, 303–304
of diabetic foot problems, 422–424
of diabetic foot ulcers, 422, 423*t*
of disability, 259, 272, 275, 275*f*
of lower extremity amputations, 422–423, 423*t*
of renal replacement therapy, 373

Edentulousness, in North American Indians
prevalence, 9
risk factors for, 503, 691

Education
disability from diabetes and, 269*f*, 269–270
health insurance coverage and, 596*t*, 597
of persons screened for diabetes, 30*t*
years, distribution of diabetic adults by, in U.S., 85, 94*f*, 94–95, 95*f*, 110*a*
comparisons with 1979–81, 99

Educational attainment, diabetes risk and, 194–195

Education programs, for North American Indians, 694

Elderly
diabetes in
and cardiovascular disease, 576*t*, 581, 582
in Chinese, 673
clinical implications, 581
complications, 581
diagnosis, 581
therapy for, 582
diabetic ketoacidosis in, 581
disability in, 265, 266
demographic factors, 267–268, 268*f*
glycemic control in, contraindications to, 527

Emergency room, frequency of use, in diabetic versus general population, 608*t*

Employer type, distribution of diabetic adults by, 85, 99, 115*a*

Employment status
disability and, 259, 265, 272*f*, 272*t*, 272–273
distribution of diabetic adults by, 97, 98*f*, 113*a*
comparisons with 1979–81, 99
IDDM and, 5
NIDDM and, 5
of persons screened for diabetes, 30*t*

Endocrinopathies, secondary diabetes with, 70*t*, 74–77

End-stage renal disease, 358–361
in African Americans, 621
survival, 621
annual death rates (1989–91), by age, race, and primary disease, 394*a*
attributed to diabetes
death rates for all patients (1989–91), by cause of death, age, sex, and race, 400*a*
death rates for CAPD/CCPD patients (1989–91), by cause of death, age, sex, and race, 397*a*
death rates for dialysis patients (1989–91), by cause of death, age, sex, and race, 395*a*
death rates for hemodialysis patients (1989–91), by cause of death, age, sex, and race, 396*a*
death rates for transplant recipients (1986–88), by cause of death, age, sex, and race, 398*a*, 399*a*
diabetic, 6–7
in North American Indians, 690,

690f
 prevalence, 349, 359, 359t, 360f, 360t
 race and, 6, 359, 360f, 360–361, 361f, 361t
 time trends in incidence, 359–360, 360f
 in Hispanic Americans, 631–632, 650–654, 652t, 653f
 survival with, 653t, 654, 654t
 in IDDM, 358
 racial differences in, 361, 361f
 smoking and, 365
 incidence, 359
 duration of disease and, 361
 by race, 360–361, 361f, 361t
 by race and type of diabetes, 361, 361f
 in NIDDM, 358
 racial differences in, 360–361, 361f
 number of new cases, by race, 360, 361t
 pregnancy and, 365
 prevalence, 359
 relationship to other diabetic complications, 367
 reported
 point prevalence, 359, 360f, 360t
 summary statistics on, 359, 359t
 risk
 drug nephrotoxicity and, 366, 367t
 type of diabetes and, 622
 survival, 371–373, 372f, 373f
 racial differences in, 371, 372f
 by treatment modality, sex, race, and primary cause of renal failure, 390a–391a
 therapy
 attributed to diabetes, incidence counts (1988–91) by age, sex, and race, 387a
 attributed to diabetes, incidence per 10 million population (1988–91), by age, sex, and race, 387a
 incidence (1988–91) by detailed primary disease, age, and race, 388a
 incidence counts by year (1982–91), age, race, sex, and primary cause of renal failure, 386a
 point prevalence counts, by year (1982–91), age, race, sex, and primary cause of renal failure,

389a
 point prevalence rates (1988–91), by age, race, and sex, 390a
 treated
 annual change in incidence, by race, 359, 360f
 percent distribution of new cases, by primary diagnosis, 360, 361f
 summary statistics on, 359, 359t
Entmacher study, cost estimates, 604–607
 disability and mortality productivity loss, 606
 hospital service, 605–606, 609
 individuals' out-of-pocket expenses, 607–608
 medication, laboratory, and other therapy/management costs, 606
 nursing home service, 606
 physician service, 605
Environmental risk factors, 689
Epidemiologic studies
 bias in, 429
 methodological problems in, 429
Epidemiology. See also Incidence; Prevalence
 descriptive, 1–4
Erectile dysfunction, diabetic, psychological factors affecting, 507, 513
Erie County, NY, IDDM prevalence study, 39t
Eskimo
 diabetes in, prevalence, 686t
 gestational diabetes in, 693, 709t
Ethacrynic acid, diabetogenic effects, 70t
Ethanol, diabetogenic effects, 70t
Etiologic fraction method, of cost estimation, 602
EURODIAB ACE Study, 165
Excess mortality
 definition, 237
 in diabetes
 versus nondiabetic persons, 237–241, 238t–240t
 proteinuria and, 358, 367
 diabetic nephropathy and, 358, 367
 in IDDM, from renal or cardiovascular disease, 358, 367
 in NIDDM, from cardiovascular disease or renal disease, 358, 367
 in Pima Indians, from cardiovascular or renal disease, 358
Exercise participation

by age, sex, and race/ethnicity, 130, 160a
 in NIDDM prevention, 191
 in persons with NIDDM, 3, 191–193, 192t
 in stroke prevention, 455
Eye care, in diabetes, 328–331, 330t

F

Familial effect, on IDDM mortality risk, 228
Family history of diabetes
 diabetes status and, 117, 121–122, 122f, 139a
 IDDM and, 117, 120–121, 122f, 139a
 by age and sex, 217a
 NIDDM and, 181, 183, 215a–219a
 in Hispanic Americans, 643
 in non-Hispanic Whites, by diabetes status and age, 216a, 217a, 218a
 in Pima Indians, 183
 in Whites, 183
 normal glucose tolerance and, 117, 121, 122f, 139a
 by age, sex, and race/ethnicity, 218a
Family income
 distribution of diabetic adults by, in U.S., 85, 95–96, 96f, 97f, 111a
 comparisons with 1979–81, 99
 health insurance coverage and, 594t, 596t, 597
Family size, distribution of diabetic adults by, in U.S., 85, 93, 109a
Fasting plasma glucose
 by diabetes status, 120, 120f
 and sex and race, 120, 137a
 in diagnosis, 18–19
 in impaired glucose tolerance, 19
 in NIDDM, 2, 15
 in Hispanic Americans, 639t, 640
 in women, by race/ethnicity, in community-based studies, 119, 119f
 as predictor of complications, 18, 19, 27
 in screening
 for NIDDM, 26f, 26t, 26–27, 27t, 28t, 36a
 and percent requiring retesting (PRR), 27, 27t
 sensitivity, 27, 27t, 28t
 specificity, 28t
 in undiagnosed NIDDM, 24, 24f, 25f

- Fat**
 animal, diabetes risk and, 676
 body. *See* Body fat distribution; Obesity
 dietary intake
 diabetes and, 519, 524
 NIDDM and, 190*t*, 190–191, 196
 in Hispanic Americans, 641
- Fatty acid binding protein 2 gene, insulin sensitivity in Pima Indians and, 189**
- Fatty acids, omega-3, protective effect against NIDDM, 190–191**
- Fatty liver, in diabetes, 469–470**
- Fecal incontinence, in diabetic patients, versus diarrhea, 466–467**
- Fee-for-service plans, percent of diabetic persons with private insurance covered by, 594*f***
- Female(s).** *See also* Sex distribution
 alcohol consumption
 by diabetes status and race/ethnicity, 159*a*
 fasting plasma glucose and, 196
 asymptomatic bacteriuria in, prevalence, 375, 376*t*
 blood glucose testing in, 138*a*
 blood pressure, by diabetes status, 146*a*
 body mass index
 by diabetes status and age, 141*a*
 by duration of NIDDM, age, and race/ethnicity, 142*a*
 measured and self-reported, by age, 144*a*
 by race/ethnicity, diabetes status, and age, 141*a*
 of childbearing age, prevalence of diabetes in, 720*f*, 720–721
 diabetes in
 prevalence, 50*f*, 51, 56*t*–58*t*
 sociodemographic characteristics, 89, 102*a*–103*a*, 104*a*–116*a*
 comparisons with 1979–81, 99
 diabetes status, with parental history of diabetes, by age, 139*a*–140*a*
 diagnosed diabetes in
 percent, by age, 64*a*
 three-year average number of, 1979–92, 66*a*
 disability in diabetes and, 268, 268*t*, 269, 269*f*
 exercise participation, by diabetes status, 160*a*
 with family history of diabetes, by diabetes status and age, 216*a*, 217*a*, 218*a*
 fasting triglycerides, by diabetes status, 153*a*, 154*a*, 156*a*
 HDL cholesterol, by diabetes status, 154*a*, 155*a*
 heart disease risk in, diabetes and, 439
 hypertension in
 by age, 147*a*
 antihypertensive treatment for, 150*a*
 by diabetes status and race/ethnicity, 147*a*–148*a*
 measured and self-reported, by age and diabetes status, 148*a*
 IDDM in, 85
 distribution, by age, 102*a*
 with impaired glucose tolerance, parity, by age, 156*a*, 158*a*
 LDL cholesterol, by diabetes status, 153*a*, 155*a*
 mean fasting triglycerides in, by diabetes status, 151*a*
 mean HDL cholesterol in, by diabetes status, 151*a*, 152*a*
 mean LDL cholesterol in, by diabetes status, 150*a*, 152*a*
 mean total cholesterol, by diabetes status, 150*a*, 151*a*
 mortality in, diabetes as underlying cause of death for, 247, 247*f*, 250, 250*f*
 newly diagnosed diabetes in, three-year average number of, 1980–92, 67*a*
 with NIDDM, parity
 by age, 156*a*, 158*a*
 by race, 156*a*
 NIDDM in, 85
 incidence, 53, 53*f*, 53*t*
 mortality, risk factors for, 251
 NIDDM prevalence in
 by family history of diabetes and age, 219*a*
 by obesity level and age, 220*a*
 nondiabetic, parity, by age, 156*a*
 with normal glucose tolerance, parity, by age, 156*a*, 158*a*
 obesity in, in NIDDM, by age, 143*a*
 overweight in, by age and race, 220*a*
 percent screened for diabetes, 29*t*
 plasma glucose in
 by age and race/ethnicity, 134*a*–135*a*
 by diabetes status, 137*a*
 smoking and, by diabetes status, 158*a*
 subscapular-to-triceps skinfold ratio, by age and diabetes status, 124, 124*f*, 145*a*
 total cholesterol, by diabetes status, 153*a*, 154*a*, 155*a*
 2-hour post-challenge plasma glucose in, by age and race/ethnicity, 135*a*–136*a*
 with undiagnosed NIDDM, 23*t*
 parity, by age, 156*a*, 158*a*
 urine glucose testing in, 137*a*
 urine ketone testing in, 138*a*
- Femoral bruits, stroke risk and, by diabetes status, 453**
- Femoral cutaneous neuropathy, in diabetes, 342**
- Fiber, dietary**
 diabetes and, 525
 intake, NIDDM risk and, in Hispanic Americans, 641
 NIDDM and, 190, 190*t*
- Fibrocalsculous pancreatic diabetes (FCPD), 72**
 classification, 613
 diagnostic criteria for, 614*t*
- Fiji islands, diabetes in, 670**
- Filipinos**
 diabetes in
 incidence, 668
 prevalence, 668
 gestational diabetes in, 709, 709*t*
 mortality in, diabetes as underlying cause of death for, 249, 249*t*
- Finland, IDDM in**
 in children, epidemiology, 168
 incidence, 40
 temporal variation in, 44*f*
 mortality from, 229*f*, 229–230, 230*f*
 age-adjusted rates, 230*f*
 age-adjusted rates, by cause, 227, 227*f*
- First National Health and Nutrition Examination Survey Epidemiologic Follow-up Survey (NHEFS), hospital discharge data in, 554**
- Fluoxetine, side effects, in adult diabetic populations, 514, 515*t***
- Foot care, in prevention of ulcers and amputations, 420, 420*t*, 421*t***
- Foot checks, frequency, 420, 420*t*, 421*t***
- Foot deformity, foot ulcer risk and, 413**

Foot pressure, foot ulcer risk and, 413

Foot ulcers

- diabetic, 410–412
 - associated conditions, 405
 - in Chippewa Indians, 413, 413t, 691
- data sources, 410
- economic impact, 422, 423t
- incidence, 7, 412, 412t
- infection, 9
- in LEAD, 405–406
- lower extremity amputation and, 409
- population-based studies, 412
- prevalence, 405–406, 412, 412t
- prevention, 7, 420–422
- progression to amputation, 411
- risk factors for, 412–413, 413t
- lower extremity amputation risk and, 417t

Footwear, in prevention of foot ulcers, 422

Fournier's gangrene, in diabetes, 495–496

FPG. See Fasting plasma glucose

Framingham Eye Study, 6

- cataract data, 322, 322f
- data on visual impairment, 296, 297f

Framingham Study

- coronary heart disease data, 435, 435t
- disability data from, 268–269, 269f
- stroke predictors in, 453, 453f
 - blood glucose levels as, 454

France, costs in, 609–610

Friedreich's ataxia, secondary diabetes with, 70t, 80

Fructose, diabetes mellitus and, 524

Funafuti, Tuvalu, diabetes in

- gender difference in, 674
- prevalence, 674

Furosemide

- diabetogenic effects, 70t
- effects on progression of diabetic nephropathy, 369

G

Gallbladder disease

- in North American Indians, 691–692
- with somatostatinoma, 76

Gallbladder operation (cholecystectomy), 471, 474

- self-reported, frequency, by sex, age, and diabetes status, 460, 461t

Gallstones

- cholesterol, 471–472
- in diabetes, 8–9, 457, 471–474
 - morbidity and mortality with, 474
- diagnosis, 472, 472t–473t
- prevalence, by diabetes status, 472, 472t–473t
- relative risk, by diabetes status, 472t–473t, 472–474
- self-reported physician-diagnosed, prevalence, by sex, age, and diabetes status, 460, 461t
- types, 471

Gamma-glutamyl transpeptidase, in diabetic patients, 469–470

Gangrene

- hospital discharge data for, 404t
- in LEAD, 405, 406
- in nursing home residents, 583

Gastric bypass surgery, for refractory morbid obesity, in NIDDM, 524

Gastrointestinal abnormalities, in diabetes, 464–468

- mechanisms, 464
- pathophysiology, 464

Gastropathy, diabetic, 464–466

Gc gene, chromosomal location, 187t

GDM. See Gestational diabetes mellitus (GDM)

Gender. See Sex

Generalized anxiety disorder, in diabetics, prevalence, 507

Genetics

- of diabetes, 2
 - thrifty gene hypothesis, 619, 676, 677
- of hypertension, in African Americans, 623
- NIDDM and, in Hispanic Americans, 642f, 642–643

Genetic syndromes, secondary diabetes with, 70t, 79–80

Genitourinary infection(s), in diabetes, 486–491

Genotype, insulin resistance syndrome and NIDDM and, 676f

Geographic distribution

- of Asian Americans, 663, 664t
- of Asian Indians, 663, 664t
- of Pacific Islander Americans, 663, 664t
- of persons screened for diabetes, 29t

Geographic region

- IDDM incidence by, 37, 169, 615
- lower extremity amputation and, 416,

416f

NIDDM prevalence by, 181–182, 182f

Gestational diabetes mellitus (GDM), 703–713

- in African Americans, 620–621
- characteristics, 16t
- classification, 613
- definition, 703, 704–705
- development of diabetes and, 621
- diabetes development after
 - incidence, 712, 712f, 712t
 - undiagnosed, 712
- diagnosis, 22t, 22–23
 - threshold for, 704, 704t
- diagnostic criteria for, 1, 19, 19t, 614t, 703, 704t, 704–705, 705t
- historical perspective on, 703–704
- IDDM risk and, 198–199
- implications
 - for mother, long-term, 712–713
 - for offspring, 711
 - for pregnancy outcome, 710–711
- incidence, 1
- NIDDM development after
 - in mother, 13
 - in offspring, 13
- NIDDM risk and, 198–199
- in North American Indians, 693, 709, 709t
- pathogenesis, 17
- perinatal mortality in, 13
- prevalence, 13, 15, 17, 703, 708–710, 709t, 721–722
 - by gestational age, 707, 707t
- reproductive risk and, 703
- risk
 - maternal age and, 705–706
 - obesity and, 705–706
- risk factors for, 703
 - in African Americans, 621
 - historic, 705–706
- screening, 22t, 22–23, 703, 705–708
 - current practice, 708
 - glucose challenge test for, 706–708
 - glycosylated hemoglobin in, 708
 - reflectance meters for, 707–708
 - timing of test for, 707, 707t
 - variations of 50-g 1-hr screen, 708

Gingival bleeding, in diabetes, 504

Gingivitis, in IDDM, 9

Glaucoma, 326–328

- definition, 293, 326
- in diabetes, 293
- incidence
 - by age, 326, 326f

by duration of diabetes, 327, 327f
in NIDDM, 6
prevalence, by diabetes status, 322f
research needs, 328

Glipizide, for NIDDM, 525

Glomerular filtration rate

antihypertensive therapy and, 369, 369f

decline

dietary protein intake and, in
IDDM, 365, 365f, 370–371, 371f

effect of albuminuria reduction on,
in IDDM, 369, 370t

serum cholesterol concentration
and, in diabetic patients, 364, 364t

in diabetes, 351f, 351–352

hyperglycemia and, 363

in pregnancy, 364

Glomerular hemodynamic function, in diabetic glomerulosclerosis, 351f, 351–352

Glomerular permeability, selective, in diabetes, 353f, 353–354

Glucagon

diabetogenic effects, 70t, 74t

extrapancreatic, 70–71

levels

in acute pancreatitis, 72

in chronic pancreatitis, 72

pancreatic, induction of ketoacidosis
and, 71

secretion, in hemochromatosis, 73

sites of action, 74t

Glucagon-like immunoreactivity, diabetes secondary to chronic pancreatitis and, 72

Glucagon-like peptide-1 receptor gene, chromosomal location, 187t

Glucagonoma

clinical features, 76

secondary diabetes with, 70t, 76

Glucagon receptor gene, chromosomal location, 187t

Glucocorticoids

diabetogenic effects, 70t, 74t, 77, 77t

metabolic effects, 75

sites of action, 74t, 77t

Glucokinase (GCK) gene mutations

diabetes secondary to, 70t, 78t, 79–80, 185t, 185–187

MODY and, 180–181, 185–187

Glucokinase regulatory protein gene, chromosomal location, 187t

Glucometers, 532

Glucose. See also Blood glucose; Fasting plasma glucose; Plasma glucose

metabolism, in acromegaly, 74

monitoring, in elderly, 582

secretion, after hemipancreatectomy,
70, 71f

Glucose intolerance, 76. See also Impaired glucose tolerance (IGT)

in acromegaly, 74

in Conn's syndrome, 75

in Cushing's syndrome, 75

epidemiology, 2

with exogenous steroid use, 75

genetic syndromes associated with,
70t, 79–80

glucocorticoid-induced, 77

with hemochromatosis, 73

with hyperthyroidism, 75–76

with hypokalemia, 75

in iron-overload states, 73

with monotropic GH deficiency, 75

with pheochromocytoma, 75

in POEMS syndrome, 76

prevalence, 47

with rare genetic syndromes, 181

with thalassemia major, 73

Glucose tolerance

abnormal. *See also* Impaired glucose
tolerance (IGT)

in migrant populations, prevalence,
195, 195t

in pregnancy, in North American
Indians, 693

normal

blood pressure and, 124–127, 125f,
126f, 146a, 147a–148a

criteria for, 117, 118

with family history of diabetes,

117, 121, 122f, 139a

by age, sex, and race/ethnicity,
218a

fasting plasma glucose with, 120,
120f, 137a

2-hour post-challenge plasma glu-
cose with, 120, 121f, 137a

women with, parity, by age and
race, 158a

tests. *See also* Oral glucose tolerance
test(s); Urine glucose test(s)

frequency, 15

Glucose transporter system

genes, chromosomal locations, 187t

NIDDM and, 185, 185t, 187

GLUT. See Glucose transporter(s)

Glutamic acid decarboxylase (GAD) antibodies, in IDDM, 3, 169–170

Glyburide, for NIDDM, 525

Glycemic control

albuminuria risk and, 363

cardioprotective effects, 429

contraindications to, in elderly, 527

difficulties, in children, 527

effects on vascular disease, 406–407

heart disease risk with, 439

in IDDM, contraindications to, 527

lower extremity amputation risk and,
418, 418f

NIDDM mortality and, 251

nutritional therapy and
in IDDM, 522

in NIDDM, 519, 522

proteinuria risk and, 363

spontaneous abortion in diabetic preg-
nancy and, 723f, 723t, 723–724

stress and, 507, 512

stroke prevention and, 455

Glycogen synthase gene

chromosomal location, 187t

mutations, diabetes secondary to, 78t

NIDDM and, 185t, 187–188

polymorphism, 80

Glycosuria, screening for, 2, 22

**Glycosylated hemoglobin. See Hemo-
globin, glycosylated**

**Gros Ventre Indians, diabetes preva-
lence in, 685t**

**Group B streptococcal infections, in
diabetes, 496**

Growth hormone

cytotropic effects on β -cells, 75

deficiency, diabetogenic effects, 70t,
75

diabetogenic effects, 70t, 74t

excess, diabetogenic effects, 70t

levels, in acromegaly, 74

metabolic effects, 75

sites of action, 74t

Growth velocity, IDDM and, 166

**Gut tumors, secondary diabetes with,
76**

H

Handicap, definition, 260

Haptoglobin

gene, chromosomal location, 187t

in Hispanic Americans, NIDDM and,

643

Hawaii

diabetes in, 665–667, 674–676
ethnic distribution, 665, 665f
in full- and part-Hawaiians and
Caucasians, 675, 675f
Japanese Americans in, diabetes in,
665–667, 666

Hawaiians

men of Japanese ancestry, cerebrovas-
cular disease mortality in, 248
mortality in, diabetes as underlying
cause of death for, 249, 249t

HDL. See High-density lipoprotein(s)**Head, elevation during sleep, for man-
agement of hypertension, 534****Health, valuing, methods for, 602–603****Health care**

access, disability and, 275
consumption, in diabetes, 5
costs, for diabetes, 11
payment sources, 10
lower extremity amputation risk and,
419
service usage, disability and, 259,
271, 274f, 274t, 274–275

**Health history, lower extremity ampu-
tation risk and, 419****Health insurance, 591–600**

complications of diabetes and, in His-
panic Americans, 655, 655f
costs, 598
individuals' out-of-pocket ex-
penses, 598
coverage
for persons with diabetes, 11
for specific aspects of health care,
595–597
data sources, 591–592
demographic characteristics and, 593,
594t
diabetic ketoacidosis and, 285
economic aspects, 598–599
government-financed, 592–593
percent of diabetic persons with,
versus nondiabetic persons,
597, 597f
lack, 595–596
adverse effects associated with,
596–597
limitations in, 596
multiple coverage, diabetic persons
with, 593, 593f
multiple types, percent of diabetic
persons covered by, 595, 595f
payments for ambulatory medical

care, 10
percent of diabetic persons with, 592,
592t
characteristics, 596t, 596–597
versus nondiabetic persons, 597f,
597–598
percent of diabetic persons without,
592
characteristics, 596t, 596–597
of persons screened for diabetes, 30t
private
expenditures for diabetic foot prob-
lems, 422, 423t
expenditures for foot ulcers and
amputations, 409
lack, reasons given for, 595t, 595–
596
percent of diabetic persons with,
592, 593f
versus nondiabetic persons, 597,
597f
proportion of diabetic persons cov-
ered by, 593, 594f
types, 593, 594f
proportion of health care expenses
covered by, 598t, 598–599
time trends in, 599, 599f
by type, 592, 593f

**Health Insurance/Employer Survey,
health insurance information
from, 591****Health maintenance organizations,
percent of diabetic persons with
private insurance covered by,
594f****Health perceptions, disability and,
277, 277f, 277t****Health preferences, disability and,
278****Health profiles, disability and, 277–
278****Health promotion, in North American
Indians, 694****Health status**

by age, sex, and diabetes status, 129–
130, 130f, 160a
in diabetes, 5
in diabetic versus nondiabetic per-
sons, 118
disability and, 259
in NIDDM, 3
self-reported
disability and, 277, 277f, 277t
by sex, age, and diabetes status,
282a

Health Surveillance Unit, Hawaii**State Department of Health, 675****Health Utility Index (HUD), 278****Heart disease, 7–8**

atherosclerotic, in North American In-
dians, 690
coronary. *See* Coronary artery disease
diabetes and, 429–448
assessment, methodological prob-
lems in, 429–430
autopsy studies, 434f, 434–435
clinical studies, 432–434
prevalence by type of diabetes, in-
sulin use, and age, 430, 430t
excess risk
in diabetic versus nondiabetic per-
sons, 8
in IDDM versus NIDDM, 8
in IDDM, mortality from, 4, 221, 222
incidence, in diabetic versus nondia-
betic populations, 435, 435f,
435t, 436t
ischemic. *See* Ischemic heart disease
mortality, heart disease risk factors
and, 439f, 439–440
natural history, in diabetic versus non-
diabetic persons, 436–438, 437t,
438f
in NIDDM, 233
mortality from, 4, 242t, 243f, 244t–
246t, 244–247
risk factors for, 243–247
prevalence
community-based studies, 431–
432, 432t, 433f
in diabetic versus nondiabetic
populations, 430–435
U.S. Survey estimates, 430–431
risk
age and, 438–439
duration of disease and, 438f, 438–
439
endogenous insulin and, 441–444,
442t
exogenous insulin and, 443t, 444
glycemic control and, 439
heart disease risk factors and, 435t,
436t, 439–440
microalbuminuria and, 440t, 440–
441, 441t
sex and, 437t, 439, 439f
risk factors for, in diabetic versus non-
diabetic persons, 438–444

Hematemesis, diabetes and, 457, 464**Hemochromatosis**

- chelation therapy with deferoxamine, 74
- cirrhosis and, 72–73
- clinical presentation, 72
- gene frequency, 72
- glucagon secretion in, 73
- HLA-A3 and, 72
- iron disposition in, 72
- mortality ratios (observed/expected), 74
- secondary causes, 72
- secondary diabetes with, 70t
- sex distribution, 72
- survival with, 73f, 74
- Hemodialysis**
- annual death rates (1989–91) for patients not yet transplanted, by age, race, and primary disease, 392a
- cause-specific death rates for, by age, race, and diabetes status, 372, 373t
- death rates for patients (1989–91) with ESRD attributed to diabetes, by cause of death, age, sex, and race, 396a
- Hemoglobin, glycosylated**
- foot ulcer risk and, 413, 413t
- high, lower extremity amputation risk and, 417t
- incidence and progression of retinopathy and, 314t, 314–315, 338a
- lower extremity amputation risk and, 418, 418f
- NIDDM mortality and, 251
- as predictor of complications, 19, 27
- prevalence of distal neuropathy and, 343
- risk of visual loss and, 303
- in screening for gestational diabetes, 708
- in screening for NIDDM, 27, 28t
- Hemorrhage, gastrointestinal, diabetes and, 464**
- Hepatocellular carcinoma, hemochromatosis and, 72, 74**
- Hereditary relapsing pancreatitis, secondary diabetes with, 70t**
- Hernia repair, self-reported, frequency, by sex, age, and diabetes status, 460, 461t**
- Herrmann's syndrome, secondary diabetes with, 70t**
- Hexokinase II gene, chromosomal location, 187t**
- HHANES. See Hispanic Health and Nutrition Examination Survey (HHANES)**
- Hiatus hernia, self-reported physician-diagnosed, prevalence, by sex, age, and diabetes status, 460, 461t**
- High-density lipoprotein(s)**
- community-based studies, 131–132, 161a, 162a, 163a, 164a
- decreased, in NIDDM, 197
- in Hispanic and non-Hispanic Americans, 659a
- diet and, in diabetes mellitus, 523–524
- levels
- lower extremity amputation risk and, 418
- with NIDDM, by race, 623, 624f
- in NIDDM, 3, 118
- in Hispanic Americans, 640
- mean level, in Hispanic and non-Hispanic Americans, 659a
- serum
- abnormalities, by age, sex, race/ethnicity, and diabetes status, 128, 154a, 155a
- by age, sex, race/ethnicity, and diabetes status, 128, 128f, 151a, 152a
- High-risk populations**
- NIDDM screening rates in, 29t, 29–30, 30t, 31f
- screening in, 28–32
- undiagnosed NIDDM in
- detection, 31t, 31–32
- prevalence, 28, 30f
- Hi-Hon-San Study, 666**
- Hiroshima University Study, 666, 666t**
- Hispanic Americans. See also Cuban Americans; Mexican Americans; Puerto Ricans**
- coronary artery disease in, 12, 646, 647t, 648t
- diabetes in, 631–659
- prevalence, 12, 52, 52f, 52t, 631
- diabetic complications in, health insurance and, 655, 655f
- diabetic nephropathy in, 650–654, 652t
- end-stage renal disease in, 12, 631–632, 650–654, 652t, 653f
- survival with, 653t, 654, 654t
- gestational diabetes in, 709, 709t
- hyperglycemia in, 647–648, 649a
- IDDM in, 643–644, 644t
- HLA associations, 168
- incidence, 1, 37, 40, 42f, 166
- age-adjusted, 40, 40t
- prevalence, 12
- risk, in relatives, 167
- macrovascular complications in, 646–647
- microvascular complications in, 647–655
- mortality in, 644–646
- all-cause, in total population, 644–645, 645t
- diabetes as underlying cause of death for, 247, 247f, 249, 249t, 250
- in diabetic persons, 645–646, 646t, 647t
- myocardial infarct/infarction in, 646, 647t, 648t
- Native American admixture in, diabetes prevalence and, 12
- neuropathy in, 654f, 654t, 654–655
- NIDDM in
- behavioral factors and, 640–641
- family history of diabetes and, 643
- genetic factors and, 642–643
- incidence, 54, 637–638, 638f, 638t
- metabolic characteristics, by sex, community-based studies, 130–132, 162a
- metabolic variables, 639t, 640, 640t
- obesity and, 638–639, 639f, 639t
- racial admixture and, 642t, 642–643
- risk factors for, 12, 638–643
- sociocultural factors and, 640t, 640–641
- NIDDM prevalence in, 52, 52f, 52t, 631–637
- and in non-Hispanic whites, comparison, 637, 637t
- percent screened for diabetes, 29t
- peripheral vascular disease in, 12, 647, 648t
- plasma glucose in, 647–648, 649a
- proteinuria in, 650–654, 652t
- retinopathy in, 648–650, 649f, 649t, 650f, 650t, 651f
- stroke in, mortality from, 449, 449t
- subgroups, 632
- women with NIDDM
- HDL cholesterol levels, 131, 164a
- LDL cholesterol levels, 131, 164a

- serum triglyceride levels, 131, 164a
- Hispanic Health and Nutrition Examination Survey (HHANES), 117, 162a, 631, 632**
- diabetes prevalence data, 635, 635t, 636f
- disability data from, 269, 269f
- gallstone disease in, 473
- methods, 118–119
- prevalence and incidence determination from, 48
- HLA antigens**
- diabetic retinopathy and, 309
- IDDM and, 3, 168–169, 172
- diabetic nephropathy and, 362
- islet cell cytoplasmic antibodies and, 170, 172
- HNC. See Hyperosmolar nonketotic coma**
- Hokkaido, Japan, IDDM incidence, temporal variation in, 44f**
- Home health care, in long-term care for diabetes, 11**
- Home health care agencies, 571, 581**
- Hong Kong, diabetes in**
- in elderly Chinese, 673
- prevalence, 673, 673t
- Honolulu Heart Program, 454, 666**
- coronary heart disease data, 435, 435t
- Hormone replacement therapy, postmenopausal, 77**
- Hormones, diabetogenic, 70t**
- Hospital discharge data. See also Hospital discharges; National Hospital Discharge Survey (NHDS)**
- 1990, 556
- coding in, 555
- limitations, 554–555
- Medicare charges and, 555
- multiple hospitalizations and, 555
- race classification in, 555
- state-based, 562, 562f
- underreporting in, 554–555
- Hospital discharges. See also Hospital discharge data; National Hospital Discharge Survey (NHDS)**
- listing complications of diabetes, 557f, 557–558, 558f
- listing diabetes, time trends in, 557, 557f, 565a
- listing diabetic ketoacidosis, 557f, 557–558, 561, 561f
- number, by age, 556, 556f
- Hospitalization(s), 553–569. See also Outpatient services**
- considered to be related to diabetes, 554
- costs, 562, 605–606
- individuals' out-of-pocket expenses, 608, 608t
- international comparison, 609
- in U.S., 604t
- data sources on, 554–556
- days, in 1987, 605
- in diabetes, 10
- average length of stay, 10
- data on, problems with, 489
- frequency, 10, 489
- disability and, 259
- for infection, 489, 490t
- in past year
- of adults with IDDM and NIDDM, 559, 559f, 560–561, 561f, 566a, 568a
- by complications and duration of diabetes, 559, 560f, 567a
- by insulin treatment, 560, 560f, 567a
- multiple, 560–561, 561f, 568a
- by race, 560, 560f, 566a, 567a
- by sex, 559f, 559–560
- of persons screened for diabetes, 30t
- Hospital services, health insurance coverage for, percent of diabetic persons with, 595**
- Hospital utilization, 553–569**
- Human capital method, 602–603**
- cost presentations methods in, 603
- Human life, valuing, methods for, 602–603**
- Huntington's chorea, secondary diabetes with, 70t**
- Huse study, cost estimates, 604–607**
- disability and mortality productivity loss, 606
- hospital service, 605
- medication, laboratory, and other therapy/management costs, 606
- nursing home service, 606
- physician service, 605
- Hydralazine, effects on progression of diabetic nephropathy, 369**
- Hyperaldosteronism, secondary diabetes with, 70t, 75**
- Hypercholesterolemia, in North American Indians, 692**
- Hyperdynamic circulation, NIDDM and, 197**
- Hyperglycemia**
- diabetic complications related to,
- pathogenesis, 374
- in diabetic persons, 120–121, 121f, 138a
- diabetic renal disease and, 363, 363f, 364f
- diabetic retinopathy and, 5, 313t, 313–317, 314t, 315t, 316t
- diet-resistant, in NIDDM, 527
- in elderly, 581
- complications, 582
- in Hispanic Americans, 647–648, 649a
- hyperosmolar, with diabetes, in elderly, 581–582
- lower extremity amputation risk and, 417t
- nephropathy and, 621–622
- prevalence, in Hispanics in Texas, 632–633, 633t
- progression to diabetes and, 196
- renal abnormalities and, 354
- screening for, 2, 22
- stroke and, 454
- transient, with acute pancreatitis, 71
- in undiagnosed NIDDM, 24, 24f, 25f
- vision disorders and, 293
- Hyperglycemic, hyperosmolar, nonketotic coma, drug-induced, 77**
- Hyperinsulinemia**
- with acromegaly, 74
- cardiovascular disease and, 692
- in Cushing's syndrome, 75
- fetal, in pregestational diabetic pregnancies, 726–727
- genetic factors associated with, 188–189
- heart disease risk and, 441–444
- NIDDM and, 620
- in Hispanic Americans, 640, 640t
- in non-cirrhotic hemochromatosis, 73
- progression to diabetes and, 196
- Hyperosmolar nonketotic coma (HNC)**
- definition, 287
- health care costs, 283
- hospitalization rates for, 5, 285t
- incidence, 5, 287
- age differences in, 287
- racial differences in, 287, 287t
- sex differences in, 287, 287t
- morbidity and mortality with, 283, 287
- mortality with, 5
- precipitating factors, 283, 287
- prevention, 287

- treatment, 283, 287
- Hypertension, 75**
- in African Americans
 - retinopathy and, 621
 - theory, 623
 - by age, sex, race, and diabetes status, 124–127, 125f, 126f, 146a, 147a–148a
 - cerebrovascular disease risk in, 451, 452, 452t
 - definition, 125
 - with diabetes, 623t
 - community-based studies, 131, 131f, 161a, 162a, 163a
 - in elderly, 576t, 582
 - diabetic renal disease and, 362–363, 363f
 - in IDDM
 - mortality and, 4
 - mortality risk and, 228, 229
 - in impaired glucose tolerance, 124–127, 125f, 126f, 146a, 147a–148a
 - prevalence, 117
 - lower extremity amputation risk and, 417t, 417–418
 - management, in diabetes mellitus, 534
 - nephropathy and, 621–622
 - in NIDDM, 3, 124–127, 125f, 126f, 146a, 147a–148a
 - in Hispanic Americans, 639t, 640
 - in Hispanic and non-Hispanic Americans, 659a
 - mortality and, 251
 - prevalence, 117
 - in nondiabetic population, 29f
 - with normal glucose tolerance, prevalence, 117
 - in normal population, 124–127, 125f, 126f, 146a, 147a–148a
 - in North American Indians, 692
 - nutritional therapy and
 - in IDDM, 522
 - in NIDDM, 522
 - parental, renal disease in diabetic offspring and, 362, 363f
 - in persons screened for diabetes, 29t
 - physician-diagnosed, in persons with NIDDM, 127, 127f, 149a
 - in pregestational diabetic pregnancy, maternal risks with, 729
 - prevalence
 - measured and self-reported, 126f, 126–127, 148a
 - with NIDDM, 623t
 - retinopathy and, in African Americans, 621
 - risk factors for, 196–197
 - sodium intake and, 525
 - stroke and, 8, 449
 - treatment
 - in diabetic patients, 454–455
 - in stroke prevention, 454–455
 - in undiagnosed NIDDM, 24, 124–127, 125f, 126f, 146a, 147a–148a
 - prevalence, 117
- Hyperthyroidism**
- metabolic changes in, 75
 - secondary diabetes with, 70t, 75–76
- Hypertriglyceridemia, alcohol consumption and, 525**
- Hypocalcemia, in offspring, in pregestational diabetic pregnancies, 727**
- Hypoglycemia**
- definition, 289
 - hospitalization rates for, 5, 285t
 - incidence, 5, 283, 289
 - age differences in, 289
 - racial differences in, 289, 290t
 - sex differences in, 289, 290t
 - insulin-induced, diabetes secondary to chronic pancreatitis and, 72
 - intensive insulin therapy and, in IDDM, 519, 527
 - maternal, in pregestational diabetic pregnancy, maternal risks with, 730
 - morbidity and mortality with, 283, 290
 - neonatal, in pregestational diabetic pregnancies, 726–727
 - precipitating factors, 283, 289
 - prevention, 289–290
 - treatment, 283, 289–290
- Hypokalemia, 75**
- diabetes and, 77
 - glucose intolerance with, 75
- IADL. See Instrumental activities of daily living**
- IAPP. See Islet amyloid polypeptide (amylin)**
- ICD9-CM. See International Classification of Diseases**
- IDDM. See Insulin-dependent diabetes mellitus (IDDM)**
- IGT. See Impaired glucose tolerance**
- Immigrants, diabetic adults as**
- as percent of population, 96–97, 112a
 - by years of living in U.S., 96–97, 112a
- Immigration, 663**
- Immigration Act of 1965, 663**
- Immunologic defects, systemic, in diabetes, and infection, 485**
- Impaired glucose tolerance (IGT), 69**
- albuminuria and, 197
 - blood pressure and, 124–127, 125f, 126f, 146a, 147a–148a
 - cholesterol abnormalities in, by age, sex, and race/ethnicity, 128, 153a, 154a, 155a
 - classification, 70t, 613
 - conversion to diabetes, glucose tolerance at baseline and, 667
 - in cystic fibrosis, 71
 - definition, 15, 19, 55
 - in definition of gestational diabetes, 704
 - diabetes development and, 19–20
 - diabetes risk in, dietary fat and, 190
 - diagnostic criteria, 117, 118
 - WHO versus NDDG, 19, 20t
 - diagnostic criteria for, 614t
 - dyslipidemia in, by age, sex, and race/ethnicity, 128, 153a–156a
 - family history of diabetes and, 117, 121, 122f, 139a, 181, 216a
 - by age, sex, and race/ethnicity, 218a
 - fasting plasma glucose in, 19, 120, 120f, 137a
 - HDL cholesterol in
 - abnormalities, by age, sex, and race/ethnicity, 128, 154a, 155a
 - by age, sex, and race/ethnicity, 128, 151a, 152a
 - incidence, 1
 - after previous gestational diabetes, 712, 712t
 - LDL cholesterol in
 - abnormalities, by age, sex, and race/ethnicity, 128, 153a, 155a
 - by age, sex, and race/ethnicity, 128, 150a, 152a
 - mean total cholesterol in, by age, sex, and race/ethnicity, 127–128, 150a, 151a
 - in migrant populations, prevalence, 195, 195t
 - NIDDM and, 198, 198t, 620
 - in Hispanic Americans, 639t, 640
 - parity and, by age, sex, and race/ethnicity, 129, 158a
 - prevalence, 15, 47, 52f, 52t, 54f, 55,

- 617*t*
 in African Americans, 617*f*, 620
 age distribution, 55
 ethnic differences in, 181–182, 182*f*
 by fasting plasma glucose level, 36*a*
 in Mauritius, 669, 669*t*
 racial distribution, 55
 worldwide interpopulation differences in, 181–182, 182*f*
 progression to NIDDM, prevention, 201–202
 risk for, thinness at birth and, 194
 as screening criterion for pre-NIDDM, 198, 199
 triglycerides in
 abnormalities, by age, sex, and race/ethnicity, 128, 154*a*, 156*a*
 by age, sex, and race/ethnicity, 128, 151*a*, 153*a*
 2-hour post-challenge plasma glucose in, 19, 120, 121*f*, 137*a*
 undiagnosed, 180
 in women of childbearing age, by race/ethnicity, 720, 721*f*
 women with, parity, by age and race, 158*a*
- Impairment, definition, 260**
- Impotence, in diabetes, psychological factors affecting, 513**
- Incidence, 1–2, 601**
 annual rate, from NAMCS, 548
 of diabetes, 47
 analysis of survey data, 48
 community studies, 55, 59*t*–60*t*
 interpretation of survey data, 48–49
 national, determination methods, 47–53
 pediatric, 615
- Income. See also Family income**
 disability and, 259, 272, 275, 275*f*
 disability from diabetes and, 269*f*, 269–270
 of persons screened for diabetes, 30*t*
- Incontinence. See Fecal incontinence; Urinary incontinence**
- India, diabetes in**
 prevalence, 673, 673*t*, 674, 674*t*
 and rice versus wheat diet, 673
- Indian Council of Medical Research, 673–674**
- Indian Health Service (IHS), 683**
 service areas, 684*f*
- Indians**
 Asian. *See* Asian Indians
 North American. *See* North American Indians
- Individual practice associations, percent of diabetic persons with private insurance covered by, 594*f***
- Infants of diabetic mothers**
 congenital malformations in, 725–726
 diabetes in, in North American Indians, 693, 693*f*
 NIDDM in, 13
 perinatal complications in, 727, 727*t*
 perinatal mortality in, 724–725
- Infection(s)**
 costs, attribution to diabetes, 602
 deep neck, from periodontal abscess, 504
 diabetes and, 9, 485–499
 pathogenesis, 485
 diabetic ketoacidosis secondary to, 284–285
 genitourinary, in diabetes, 486–491
 group B streptococcal, in diabetes, 496
 hospitalizations for, 489, 490*t*
 lower extremity, in diabetes, 491–492
 in nursing home residents, 583
 with hyperglycemia, 582
 oral. *See also* Periodontal disease in diabetes, 501
 pathogenesis, 504
 respiratory. *See also* Bronchitis; Influenza; Pneumonia; Sinusitis in diabetes, 492–493
 risk, in diabetes, 485
 risk factors for
 in diabetes, 485
 in North American Indians, 691
 types, in diabetes, 485
- Influenza, in diabetes, 492**
 mortality from, 242*t*, 243*f*, 249, 492
- Institute of Medicine's Committee on Nursing Home Regulation, 583**
- Instrumental activities of daily living**
 disability and, 275–276, 276*f*, 276*t*
 restriction, in diabetes, 265, 265*f*, 266
- Insulin**
 antibodies, in IDDM, 3
 deficiency, with monotropic GH deficiency, 75
 endogenous, heart disease risk and, 441–444, 442*t*, 443*t*
 exogenous. *See also* Insulin therapy
 diabetic retinopathy and, 318
 heart disease risk and, 443*t*, 444
 fasting levels
 genetic factors associated with, 188–189
 in Hispanic Americans, in NIDDM, 639*t*, 640, 659*a*
 in non-Hispanic Americans, in NIDDM, 659*a*
 mutant (abnormal)
 characteristics of probands with, 79*t*
 secondary diabetes with, 70*t*, 79
 plasma level, community-based studies, 130
 secretion, after hemipaneurectomy, 70, 71*f*
- Insulin autoantibodies (IAA), in IDDM, 169–170**
- Insulin-dependent diabetes mellitus (IDDM), 1**
 activity limitations in, versus nondiabetic populations, 267, 268*f*
 adult-onset, incidence, 1
 in African Americans, risk factors for, 615–616
 age-adjusted mortality, 230*f*
 by cause and country, 227, 227*f*
 albuminuria in, 6
 cumulative incidence, 356, 357*f*
 prevalence, 354, 354*t*, 355*f*
 as risk factor for death, 357–358
 alcohol consumption and, by age, sex, and race/ethnicity, 159*a*
 ambulatory care visits for, frequency, 547, 547*f*, 547*t*
 in Asian Americans, 663–664
 autoimmunity and, in African Americans, 616
 autonomic neuropathy in, 346*t*, 347
 renal disease and, 364
 blood glucose testing in
 by age, 138*a*
 by sex, 138*a*
 bronchitis in, 487*t*
 cardiovascular disease in, 429
 mortality from, 221, 222, 222*f*, 225–226, 226*f*
 caries (tooth decay) in, 501
 carpal tunnel syndrome in, 341*f*, 341–342
 celiac disease risk in, 457
 characteristics, 16*t*
 classification, 613
 complications, 17
 corneal disease in, 328
 dextran clearance profiles in, 353
 diabetic ketoacidosis in, 283
 diabetic nephropathy in
 familial clustering, 361–362, 362*f*

natural history, 350, 350f
 smoking and, 365–366, 366t

diagnosis, 16–17, 38

diagnostic criteria for, 1, 614t
 in NHANES II, 118

disability in, 5, 267, 267t
 activity limitations and, 263, 263f, 264f, 264t, 275–276, 276f, 276t, 281a
 consequences, 259
 demographic factors affecting, 267
 health care use and, 274f, 274t, 274–275
 health perceptions and, 277, 277f
 health profiles and, 278
 late complications of diabetes and, 270, 270f, 270t
 prevalence, 259, 263, 263f
 by sex and age, 281a

distribution
 by age, 85, 87, 88f, 102a–103a
 by age at diagnosis, 90
 by age at diagnosis, sex, and race, 90, 90f
 by age at onset, 85, 90, 90f, 104a, 166
 among immigrants, by years of living in U.S., 96–97, 112a
 by cohabitation status, 93, 93f, 108a
 by duration of disease, 85, 89, 90f, 104a
 by employment status, 85, 97, 98f, 113a
 by family income, 85, 95–96, 96f, 111a
 by family size, 85, 93, 109a
 by immigrant status (percent of population), 96–97, 112a
 by marital status, 85, 92f, 92–93, 107a
 by race/ethnicity, 89, 89f, 165–166, 166, 166f
 regional, 85, 90, 91f, 105a
 by sex, 85, 89
 by size (in thousands) of urban population, 85, 91, 91f, 106a
 by type of employer, 85, 99, 115a
 by urban/rural residence, 91, 91f, 106a
 by usual activity, 97–98, 114a
 by years of education, 85, 94–95, 95f, 110a

duration
 diet and, 521, 521t, 540a

insulin therapy and, 521, 521t
 oral hypoglycemic agents and, 521, 521t

in elderly, clinical implications, 581

employment status and, 5

end-stage renal disease in, 358
 racial differences in, 361, 361f
 smoking and, 365

epidemic pattern, 43

epidemiology, 165, 173

etiology, 17
 environmental factors in, 166–167, 664
 interaction of genetic and environmental factors in, 171
 with family history of diabetes, 117, 120–121, 122f, 139a
 by age and sex, 217a

foot ulcer incidence in, 412

gastrointestinal symptoms in, 465t, 465–466

genetics, 3, 165, 167–170

glomerular filtration rate in, 351f, 351–352

glutamic acid decarboxylase antibodies in, 169–170

growth velocity and, 166

health status in, 129–130, 160a
 by age, 160a
 by sex, 160a

heart disease in
 excess risk for, 8
 mortality from, 221, 222, 225, 226f
 prevalence, 430, 430t

high blood glucose in, 120–121, 121f, 138a

in Hispanics, 643–644

HLA associations, 3, 165, 168–169, 172
 in African Americans, 615–616

diabetic nephropathy and, 362

hospitalizations, considered to be related to diabetes, 554

host susceptibility, 165, 167–170

hypertension in
 measured and self-reported, by age and sex, 148a
 mortality and, 4

hypoglycemia in, mortality from, 227–228

incidence, 1, 37, 39t, 39–40, 165, 601
 in adults, 40, 40t
 by age at onset, 42, 42f
 age distribution, 166
 in children, 1

in children under 16 years old, *f*, 37

geographic variation in, 37, 169, 615

international, 165, 165f
 variation in, 40, 40f, 41f

in Japan, 663

mumps virus infection and, 172

pubertal peak, 42, 42f

racial and ethnic variation in, 37, 40t, 40–42

seasonal variation, 37, 42, 42f, 166–167
 by race, 167, 167f
 by sex and age, 42, 42f, 42t, 43t
 sex distribution, 166, 166f
 socioeconomic status and, 173
 spiking patterns, 43, 44f
 time trends in, 42–43, 43f, 43t

insulin autoantibodies in, 169–170

insulin therapy for. *See* Insulin therapy

insulin-treated, prevalence, 15, 17

islet cell cytoplasmic antibodies in, 169–170

latent, presenting as NIDDM, 180

lower extremity amputation risk and, 418

mean age at diagnosis, 85, 105a

microalbuminuria in, as risk factor for death, 357–358

military status (percent of population) and, 85, 99, 116a

mortality in, 4, 221–230
 in African Americans, 625
 Allegheny County, PA DERI cohort study, 223, 223f, 225, 225f, 227, 227f, 229f, 229–230, 230f
 cause of death in, 221, 225–228, 229, 230f
 death certificate data. *See* Death certificate data
 DERI classification, 227, 227f
 duration of disease and, 221, 225, 226f, 229, 229f
 international variations in, 221, 227, 227f, 229f, 229–230, 230f
 Joslin Clinic (Boston, MA) study, 222, 223, 223f, 224, 224f, 228
 Pittsburgh Children's Hospital study, 223, 223f, 224–225, 225f, 228–229
 Pittsburgh Epidemiology of Diabetes Complications Study, 225, 226f, 228
 prior to 1980, 221–222

- by proteinuria, age, and sex, 358, 358f
 - risk factors for, 228–229
 - Steno Memorial Hospital, Denmark, 225–226, 226f, 228–229
 - time trends in, 221, 223, 224f, 224–225, 225f
 - in U.S. versus other countries, 221, 227, 227f, 229f, 229–230, 230f
 - Wisconsin Epidemiologic Study of Diabetic Retinopathy (WESDR), 224, 225–226, 226f, 228
 - mortality risk
 - absolute versus relative, 223–224
 - and age at onset, 221, 222, 229, 230f
 - blindness and, 229
 - blood pressure and, 228
 - diuretic therapy and, 229
 - familial effect in, 221, 228
 - hypertension and, 221, 222, 229
 - laser therapy and, 229
 - metabolic regulation and, 228–229
 - peripubertal onset and, 229
 - physical activity and, 229
 - plasma lipoproteins and, 228
 - prepubertal onset and, 229
 - racial differences in, 221, 228
 - renal disease and, 221, 222, 222f, 225, 226, 226f, 227, 227f, 229, 230f
 - retinopathy and, 229
 - sex distribution, 228, 229–230, 230f
 - smoking and, 221, 228
 - nephropathy with
 - antihypertensive therapy and, 369f, 369–370, 370t
 - effect of captopril on incidence of renal disease with, 370, 370f
 - effect of dietary protein reduction on, 370–371, 371f, 371t
 - insulin therapy and, 367–368
 - metabolic control and, 367–368, 368f, 368t
 - mortality from, 221, 222, 222f, 225–226, 226f, 227, 227f, 229, 230f
 - neuropathy with, 6
 - prevalence, 339, 341, 341f
 - in San Luis Valley Study, 342f, 342–343
 - new cases, annual, 40
 - in North American Indians, 683
 - nutritional therapy for. *See* Nutritional therapy
 - onset, seasonal variation in, 166–167
 - oral complications, 501
 - in Pacific Islander Americans, 663–664
 - pancreatic cancer in, 475
 - pancreatic transplantation for, 519, 533
 - effects on renal function, 533
 - nephropathy and, 533
 - pandemic, 43
 - parental history of diabetes and
 - by age, 140a
 - by sex, 140a
 - parotid gland enlargement in, 504
 - pathogenesis, 17
 - patient characteristics in, 520t
 - pediatric, 615, 615f
 - in African Americans, 613, 615
 - in Barbados, 615
 - cow's milk proteins and, 171
 - on Martinique, 615
 - and prevalence of paternal versus maternal IDDM, 168
 - and race and gender, 615
 - socioeconomic status and, 616
 - in Virgin islands, 615
 - in whites, 613
 - periodontal disease in, 9, 501–502, 502f
 - metabolic control and, 502
 - retinal changes and, 502, 502f
 - population studies, 165–167. *See also* Wisconsin Epidemiologic Study of Diabetic Retinopathy (WESDR)
 - and pregnancy
 - implications for offspring, 727, 727t
 - prevalence, 721–722
 - prevalence, 1, 15, 17, 17t, 37, 38–39, 39t, 48–49
 - in African Americans, 616t, 616f, 616–618
 - in children, 39
 - in Hispanic Americans, 631
 - in pregnant women, 721–722
 - in relatives of patients, 3
 - in total population, 39
 - proteinuria in, 6
 - duration of disease and, 356, 356f, 357f
 - glycemic control and, 363, 363f
 - prevalence, 354, 354t, 355f
 - smoking and, 365–366, 366t
 - registries, 37, 38
 - case definition for, 38t
 - in North America, 38f
 - in WHO Multinational Project for Childhood Diabetes (Diamond), 38f
 - retinopathy in, effects of insulin therapy, 293
 - risk
 - nutrition and, 170–171
 - in relatives, 167t, 167–168
 - of subjects with NIDDM, 168
 - risk factors for, 3, 165–173
 - environmental, 170–173
 - salivary secretion in, 504
 - sinusitis in, 487t
 - smoking and
 - by age, sex, and race/ethnicity, 129, 129f, 158a, 159a
 - by age and sex, 159a
 - mortality and, 4
 - susceptibility genes, racial admixture and, 615
 - therapies for. *See also* Insulin therapy; Nutritional therapy; Oral hypoglycemic agents; Therapy
 - characteristics, 522, 522t
 - usage, 523f, 540a
 - total number of people who have, 39
 - twin studies, 170
 - concordance rate, 3
 - urinary tract infection in, 487t, 488
 - urine glucose in, 120–121, 121f, 138a
 - urine glucose testing in
 - by age, 137a
 - by sex, 137a
 - urine ketones in, 121, 138a
 - urine ketone testing in
 - by age, 138a
 - by sex, 138a
 - vascular complications in, 526
- Insulin gene**
- chromosomal location, 187t
 - mutations, 79
 - diabetes secondary to, 78t
- Insulin-like growth factor 1, serum levels, in acromegaly, 74**
- Insulin-like growth factor cluster gene, chromosomal location, 187t**
- Insulin pump, 522t, 523, 526**
- therapy, hypoglycemia and, 290
- Insulin receptor gene**
- chromosomal location, 187t
 - mutations, diabetes secondary to, 78t, 79

RFLP, in Hispanic Americans, NIDDM and, 643

Insulin receptor substrate-1 (IRS-1) gene
 chromosomal location, 187*t*
 mutations, diabetes secondary to, 78*t*
 in NIDDM, 188
 polymorphism, 80

Insulin resistance
 with acromegaly, 74
 cardiovascular disease and, 692
 in Cushing's syndrome, 75
 diabetes and, 671
 genetics, 188–189
 candidate genes, 188
 heart disease risk and, 441–444
 insulin resistance syndrome and, 676*f*
 with iron overload, 73
 islet amyloid polypeptide (amylin) and, 198
 in NIDDM, 179, 180, 200, 620, 676*f*
 in Hispanic Americans, 640, 640*t*
 obesity-associated, 80
 secondary diabetes with, 70*t*, 80
 in Pima Indians, as diabetes risk factor, 688–689
 progression to diabetes and, 196
 risk for, thinness at birth and, 194
 weight gain and, 200

Insulin resistance syndrome(s)
 development, 676*f*
 secondary diabetes with, 70*t*
 thrifty genotype hypothesis and, 676

Insulin sensitivity, age-related decline in, physical inactivity and, 193

Insulin signal transduction pathway genes, in NIDDM, 188

Insulin therapy
 albuminuria and proteinuria in NIDDM and, 355*t*
 cardiovascular disease and, 692
 diabetic retinopathy and, 318
 disability and, 259, 270, 270*t*
 dosage and administration, 10
 duration of diabetes and, 521, 521*t*
 effects on IDDM mortality rates, 222, 224, 224*f*
 heart disease risk and, 443*t*, 444
 hypoglycemia with, 289–290
 for IDDM
 risks associated with, 519
 usage, 519, 520, 520*t*
 intensive
 for diabetes mellitus, 526–527
 effects on retinopathy, 293

hypoglycemia and, 527
 for IDDM, hypoglycemia with, 527
 metabolic complications, acute, 283
 for NIDDM, 519
 usage, 520, 520*t*, 521*t*
 protective effect against retinopathy, 293
 retinopathy and, 6
 use statistics, 10, 15

Intermittent claudication, in lower extremity arterial disease, 401, 404–405

International Classification of Diseases, coding
 and allocation strategy for comorbid conditions, 602
 in NHDS, 554

International Pancreas Transplant Registry (IPTR), 533

Intervention strategies, for North American Indians, 693–694

Inuits, diabetes prevalence in, 684, 684*t*
 by region, 685*t*

IPTR. See International Pancreas Transplant Registry

Irritable bowel syndrome, 460, 467*t*

Ischemic heart disease
 diabetes and
 age and, 429
 epidemiology, 429
 prevalence, 429
 with diabetes as secondary diagnosis, hospital discharge data on, 558, 561, 561*f*, 565*a*
 diagnostic criteria, 430
 incidence, in diabetic versus nondiabetic populations, 435, 435*f*, 435*t*, 436*t*
 mortality with, 8
 in NIDDM, 233, 242*t*, 243*f*, 243–247, 244*t*–246*t*
 in NIDDM, mortality from, risk factors for, 243–247
 in North American Indians, 692

Islet amyloid polypeptide (amylin) gene
 chromosomal location, 187*t*
 NIDDM and, 185, 185*f*, 186*t*
 insulin resistance and, 198
 NIDDM and, 197–198

Islet cell cytoplasmic antibodies (ICA)
 CMV genome positivity and, 172
 HLA associations, 170
 in IDDM, 3, 169–170

IDDM and, in African Americans, 616

Islet cell mass, secondary diabetes and, 70

Israel, IDDM in
 age-adjusted mortality in, 230*f*
 by cause, 227, 227*f*
 incidence, 165
 mortality from, 229*f*, 229–230, 230*f*

Italy, IDDM incidence in, 165, 166

J

Jamaica, diabetes in, 72

Japan
 diabetes prevalence in, 672
 diabetic patients in, growth in number, 671*f*
 dietary patterns in, time trends in, 676, 676*f*
 IDDM in
 age-adjusted mortality, 227, 227*f*, 230*f*
 HLA associations, 168
 incidence, 40, 42, 663
 mortality from, 229*f*, 229–230, 230*f*
 NIDDM in, 671–672

Japanese
 diabetes in
 in Brazil, 669
 mortality from, 669, 669*t*
 in native versus migrant population, 666
 prevalence, 665*f*, 669, 670*f*
 genes associated with IDDM in, 663
 mortality in, diabetes as underlying cause of death for, 249, 249*t*
 stroke risk, by age, sex, and diabetes status, 452*f*, 453

Japanese Americans
 diabetes in
 in Hawaii, 665–667, 666
 mortality from, 667, 667*f*
 prevalence, 666–667
 diabetic retinopathy in, risk factors for, 309
 foreign-born, 663
 macronutrient intake
 by glucose-tolerance status, 675*t*
 versus Japanese men, 676*t*
 with NIDDM
 metabolic characteristics, by sex, community-based studies, 130–132, 161*a*
 women
 HDL cholesterol levels, 131, 164*a*

LDL cholesterol levels, 131, 164a
 serum triglyceride levels, 131, 164a

NIDDM in, 12–13
 prevalence, 1
 second-generation (Nisei)
 baseline and follow-up diagnoses in, 667t
 diabetes in, 666t, 666–667, 667t
 impaired glucose tolerance in, 667, 667t

Japanese National Institute of Health, 666

Jaundice, neonatal, in pregestational diabetic pregnancies, 727

Jefferson County, AL
 aseptic meningitis cases, 44f
 IDDM incidence in
 in children, 166
 by sex, 43t
 time trends in, 43f, 44f

Joslin Clinic (Boston, MA)
 heart disease data, 432
 IDDM mortality studies, 222, 223, 223f, 224, 224f, 228
 proteinuria studies, duration of IDDM and, 357f

J-type diabetes, 72

K

Kearns-Sayre syndrome, secondary diabetes with, 70t

Kentucky, IDDM prevalence study, 39t

Ketoacidosis. See also Diabetic ketoacidosis
 bicarbonate levels and, 284
 with hyperthyroidism, 75
 normoglycemic, 284

Ketones, urine, in diabetic persons, 121, 138a

Ketosis, IDDM and, in African Americans, 616

Kidney disease
 chronic, nonaspirin NSAIDs and, 366, 366t
 diabetic, 6–7, 349–400. *See also* Bacteriuria; Diabetic glomerulosclerosis; Diabetic nephropathy; End-stage renal disease; Kidney failure; Papillary necrosis; Pyelonephritis
 angiotensin converting enzyme inhibitor therapy and, 369f, 369–370, 370t

autonomic neuropathy and, 364
 blood pressure control and, 369f, 369–370, 370t
 control and treatment, 7, 367–375
 course, 350, 350f
 diet and, 365, 365f, 365t
 dietary modification and, 370–371, 371f, 371t
 drug nephrotoxicity and, 366, 367t
 economic impact, 349
 in elderly, 576t, 581, 582
 familial clustering, 361–362, 362f
 genetic factors in, 361–362
 genetics, 7, 349
 hyperglycemia and, 363, 363f, 364f
 hypertension and, 362–363, 363f
 lipids and, 364, 364t
 metabolic control and, 367–369, 368f, 368t, 369t
 in North American Indians, 690, 690f
 pregnancy and, 364–365
 prevalence, 349
 relationship to other complications, 367
 risk factors for, 7, 349, 361–366
 smoking and, 365–366, 366t
 treatment, 367–375

in IDDM
 coronary artery disease and, 226
 mortality from, 221, 222, 222f, 225–226, 226f, 227, 227f, 229, 230f
 in nondiabetic population, 29f
 in persons screened for diabetes, 29t

Kidney failure
 in diabetes
 dialysis for, and patient survival, 371, 372f
 dietary protein intake and, 370–371, 371f
 transplant for, and patient survival, 371, 372f
 radiocontrast-induced, 7, 376

Kidney function, pancreatic transplantation and, 533

Kidney infection(s). See also Pyelonephritis
 prevalence, by diabetes status and sex, 488t

Kidney morphology, in diabetes, 352f, 352–353

Kidney transplant
 cause-specific death rates for, by age, race, and diabetes status, 372,

374t
 counts (1982–91), by donor type, year of transplantation, and primary cause of renal failure, 391a
 economic impact, 373

Kidney transplant recipient(s)
 with diabetic ESRD, death rates, by type of transplant, cause of death, age, sex, and race, 398a, 399a
 at risk in first 3 years post-transplant, annual death rates, by age, race, and primary disease, 393a, 394a
 survival, by type of donor and cause renal failure, 371, 372f

King County, WA, age-adjusted prevalence of coronary heart disease in, 432t

Klinefelter's syndrome, secondary diabetes with, 70t

Knee jerk reflex, changes, by diabetes status, 344f, 345, 345f

Koreans, diabetes in
 incidence, 668
 prevalence, 668, 674, 674t

L

LA. See Lactic acidosis

Laboratory tests, costs, 606

Lactic acidosis, 288–289
 definition, 288
 with diabetic ketoacidosis, 288
 health care costs, 283, 289
 hospitalization for, 5, 288–289
 incidence, 5, 283, 288
 age differences in, 288
 racial differences in, 288, 288t
 sex differences in, 288, 288t
 morbidity and mortality with, 283, 289
 phenformin-induced, 288
 precipitating factors, 283, 288
 prevention, 288–289
 treatment, 283, 288–289

Lactoglobulin, childhood IDDM and, 171

Lactose malabsorption, in diabetic patients, 467

Laredo, TX, Hispanics in, NIDDM prevalence in, 632, 632t

Large-for-gestational-age infant(s), in pregestational diabetic pregnancies, 726f, 726–727

Laser therapy, IDDM mortality risk

- and, 229**
- Latin America, IDDM incidence in, 166**
- Laurence-Moon-Biedl syndrome, secondary diabetes with, 70t, 80**
- Laxative use, in diabetes, 467–468**
- LDL. See Low-density lipoprotein(s)**
- LEAD. See Lower extremity arterial disease (LEAD)**
- LEAs. See Lower extremity amputation(s)**
- Legal blindness. See Blindness/legal blindness**
- Leg ulcers. See also Foot ulcers**
 chronic
 in diabetes, 406
 hospital discharge data for, 404t
 in diabetes, 410t
 by age, 410–411, 411f
 length of hospital stay for, 411, 411f
 prevalence, 410–411, 411f
 by race, 411, 411f
 by sex, 411, 411f
- Lens opacities, in diabetes, 322–323, 324t**
- Leprechaunism, secondary diabetes with, 70t**
- Lichen planus, in diabetes, 504**
- Life expectancy**
 in general population, 242, 256a
 in IDDM, 224, 224f
 in IDDM, 4
 in NIDDM, 4, 233, 241t, 241–243
- Life insurance enrollees, IDDM mortality rates in, 224, 224f**
- Lifestyle**
 diabetes and, 676
 insulin resistance syndrome and, 676f
 NIDDM and, 189–196, 665, 676f
 as risk factor, in North American Indians, 688
- Linkage studies, in NIDDM, 185, 186t**
- Lipid(s), serum**
 diabetic renal disease and, 364
 diabetic retinopathy and, 313t, 320
 nutritional therapy and, in diabetes mellitus, 522
- Lipodystrophic syndromes, secondary diabetes with, 70t**
- Lipoprotein(s)**
 abnormalities, lower extremity amputation risk and, 418
 serum
 by age, sex, race/ethnicity, and diabetes status, 127–128, 128f, 150a–153a
 cerebrovascular disease risk and, 451
 diabetic renal disease and, 364
 IDDM mortality and, 228
 monitoring, in stroke prevention, 455
 in Pima Indians, 692
- Lipoprotein(a) gene, chromosomal location, 187t**
- Lipoprotein lipase gene**
 chromosomal location, 187t
 in insulin resistance syndrome, 188–189
- Lithium, diabetogenic effects, 70t**
- Liver disease**
 as cause of diabetes, 470–471, 471f
 diabetes and, 8–9, 457, 462t–463t, 469–471
 diabetes as cause of, 469–470
 prevalence of diabetes in, 470–471, 471f
 spectrum, 469
- Long-term care, 571–590. See also Home health care; Nursing homes**
 costs, 606. *See also* Nursing homes
 data sources on, 571
 definition, 572
 for diabetes, 10–11
 legislation, 590a
- Loop diuretics, diabetogenic effects, 70t, 77**
- Low-density lipoprotein(s)**
 community-based studies, 131–132, 161a, 162a, 163a
 diet and, in diabetes mellitus, 523–524
 elevated
 in NIDDM, in Hispanic and non-Hispanic Americans, 659a
 stroke risk with, 8
 with NIDDM, 3, 118
 levels, by race, 623, 624f
 mean, in Hispanic and non-Hispanic Americans, 659a
 serum
 abnormalities, by age, sex, race/ethnicity, and diabetes status, 128, 153a, 155a
 by age, sex, race/ethnicity, and diabetes status, 128, 128f, 150a, 152a
 diabetic renal disease and, 364
 in undiagnosed NIDDM, 24
- Lower extremity**
 abscess, in diabetes, 410t
 bypass grafts, costs, 423–424
 infection, in diabetes, 491–492. *See also* Foot ulcers
 microbiology, 491
 ulcers. *See* Foot ulcers; Leg ulcers
- Lower extremity amputation(s), 414–415**
 bilateral, definition, 428a
 caused by diabetes, discharge data on, 558, 558f
 consequences, 409
 data sources, 410
 definition, 428a
 in diabetes, 401, 491
 age and, 415, 415f
 cutaneous circulation and, 417, 417t
 epidemiology, 409
 foot ulcers and, 409
 geographic region and, 416, 416f
 hospitalizations for, 414–415
 length of hospital stay for, 415, 415f
 lower extremity arterial disease and, 417t, 417–418
 perioperative mortality with, 409
 peripheral neuropathy and, 416, 417t
 prevalence, 409
 race/ethnicity and, 415–416, 416f
 risk factors for, 415–419, 417t
 second, frequency, 409
 sex and, 415, 416f
 survival after, 401
 in VA hospitals, 415
 discharge status after, 422
 economic impact, 422–423, 423t
 in elderly, 581–582
 first-event, definition, 428a
 in IDDM, 418
 incidence, 7
 indications for, 414
 length of hospital stay with, 561, 561f
 mortality after, 420, 420t
 new, 419t, 419–420
 definition, 428a
 in NIDDM, 418
 in North American Indians, 690–691
 in nursing home residents, 583
 perioperative mortality with, 7
 prevalence, in diabetic versus nondiabetic populations, 414, 414t, 415t
 prevention, 7, 420–422
 rate, among African Americans, 622
 reamputation, definition, 428a

revision, definition, 428a
risk, proteinuria and, 367
risk factors for, 7
 interventions for, 421t, 421–422
second, 419t, 419–420
 definition, 428a
 incidence, 7, 401

Lower extremity arterial disease (LEAD)

age and, 401
angiography in, 402
ankle-brachial index in, 402
assessment, 401–402
clinical manifestations, 401
complications, 7
definition, 401
in diabetes, 401
 confounding factors in, 401
diagnosis, 401
diagnostic criteria, 7
Doppler ultrasound in, 402
foot ulcers in, 405–406
gangrene in, 405, 406
hospital discharge data for, 403, 404t
incidence, 7, 401, 403–405, 405t
intermittent claudication and, 401, 404–405
lower extremity amputation risk and, 417t, 417–418
morbidity in, 405–406
mortality in, 7, 401, 406
prevalence, 401, 402–403, 403t
prevention, 406–407
progression to gangrene or ulceration, 402
pulse deficits in, 401, 404–405
risk factors for, 405
toe systolic blood pressure index (TSPI) in, 402

Lummi Indians, diabetes in, prevalence, 686t

M

Machado disease, secondary diabetes with, 70t

Macroalbuminuria

definition, 350
in diabetes, 6–7
in IDDM
 metabolic control and, 368, 368f
 prevalence, 354, 355f
in NIDDM, prevalence, 355, 355f
in Pima Indians, duration of disease and, 355, 356f

Macrosomia

in diabetic pregnancy, 719
gestational diabetes and, 710–711
in offspring of women with NIDDM, 118
in pregestational diabetic pregnancies, 726f, 726–727
 long-term obesity risk with, 726
 morbidity with, 726

Macrovascular disease

in Hispanic Americans, 646–647
in nondiabetic population, 29f
in persons screened for diabetes, 29t

Macular edema, with diabetic retinopathy, 305

Magnesium, dietary, for hyperglycemia, 525

Major depressive disorder, in adult diabetic population, 512. See also Depression

prevalence, 283, 508t, 508–509, 509t, 510t
 methodological issues, 509, 510t

Makah Indians, diabetes prevalence in, 686t

Malays, diabetes in

prevalence, 669t
in Singapore, 669t

Male(s). See also Sex distribution

alcohol consumption, by diabetes status and race/ethnicity, 159a
asymptomatic bacteriuria in, prevalence, 375, 375t
blood glucose testing in, 138a
blood pressure, by diabetes status, 146a
body mass index
 by diabetes status and age, 141a
 by duration of NIDDM, age, and race/ethnicity, 142a
 measured and self-reported, by age, 144a
 by race/ethnicity, diabetes status, and age, 141a
with diabetes
 annual death rate, 237
 prevalence, 50f, 51, 56t–58t
 sociodemographic characteristics, 89, 102a–103a, 104a–116a
 comparisons with 1979–81, 99
 diabetes status, with parental history of diabetes, by age, 139a–140a
 diagnosed diabetes in
 percent, by age, 64a
 three-year average number of,

1979–92, 66a

disability in, 268, 268t, 269, 269f
exercise participation, by diabetes status, 160a
with family history of diabetes, by diabetes status and age, 216a, 217a, 218a
fasting triglycerides, by diabetes status, 153a, 154a, 156a
HDL cholesterol, by diabetes status, 154a, 155a
hypertension in
 by age, 147a
 antihypertensive treatment for, 150a
 by diabetes status and race/ethnicity, 147a–148a
 measured and self-reported, by age and diabetes status, 148a
IDDM in, distribution, by age, 102a
LDL cholesterol, by diabetes status, 153a, 155a
mean fasting triglycerides in, by diabetes status, 151a
mean HDL cholesterol in, by diabetes status, 151a, 152a
mean LDL cholesterol in, by diabetes status, 150a, 152a
mean total cholesterol, by diabetes status, 150a, 151a
mortality in, diabetes as underlying cause of death for, 247, 247f, 250, 250f
newly diagnosed diabetes in, three-year average number of, 1980–92, 67a
with NIDDM, children
 by age, 156a
 by race, 156a
NIDDM in, incidence, 53, 53f, 53t, 54f
NIDDM prevalence in
 by family history of diabetes and age, 219a
 by obesity level and age, 220a
nondiabetic, parity, by age, 156a
obesity in, in NIDDM, by age, 143a
overweight in, by age and race, 220a
percent screened for diabetes, 29t
plasma glucose in
 by age and race/ethnicity, 134a–135a
 by diabetes status, 137a
smoking and, by diabetes status, 158a
subscapular-to-triceps skinfold ratio, by age and diabetes status, 124,

- 124f, 145a
total cholesterol, by diabetes status, 153a, 154a, 155a
2-hour post-challenge plasma glucose in, by age and race/ethnicity, 135a–136a
undiagnosed NIDDM in, 23t
urine glucose testing in, 137a
urine ketone testing in, 138a
- Malignant external otitis. See Otitis externa, malignant**
- Malignant neoplasia**
mortality from, in diabetes, 242t, 243f, 249
in NIDDM, mortality from, 4
- Malnutrition-related diabetes, 70t**
prevalence, 72
subgroups, 72
- Marital status**
of diabetic adults, 92f, 92–93, 107a
in persons screened for diabetes, 29t
- Martiniq, IDDM incidence in, 615**
- Massachusetts General Hospital, data on reinfarction risk and death after acute MI, 436, 437t**
- Maternal age**
birth rates by, for black and white women, 721, 721f
distribution of live births by, 721, 721f
IDDM risk in offspring and, 172
- Maternal diabetes. See also Gestational diabetes mellitus (GDM); Pregnancy, preexisting diabetes and**
fetal complications, 719, 722–727
percent of birth certificates listing, 1991, 621f
perinatal mortality and, 724f, 724–725
prevalence, data sources for, 720
- Maternal mortality, in pregestational diabetic pregnancies, 727**
- Maturity-onset diabetes of the young (MODY), 180–181**
atypical, in African-American children, 614
chromosome 20q markers in, 180
genetics, 79–80, 180–181
glucokinase (GCK) gene and, 180–181, 185–187
in RW pedigree, 180
- Mauritius**
IGT in, 669, 669t
NIDDM in, 668–669, 669t
prevalence, 668–669, 669t
population, 668
- Medicaid**
coverage
by race, 594t
by sex, 594t
for home health care recipients, changes in, 581
for nursing home residents, 571, 584
by diabetes status, 579, 580f
payments for ambulatory medical care, 10
percent of diabetic persons with, 592, 593f
versus nondiabetic persons, 597, 597f
for persons with diabetes, 11
- Medical care, for diabetes, 9–11**
- Medical Outcomes Study, health profiles from, 278, 278f**
- Medical records, for diagnosis of diabetes, accuracy, 87**
- Medical services**
in NIDDM, by race, 622t
volume, methods of estimating, 603–604
- Medicare**
changes in
for home health care recipients, 581
hospital discharge data and, 555
coverage
for persons with diabetes, 11
by race, 594t
expenditures
for ambulatory medical care, 10
for diabetic foot problems, 409, 422–424, 423t
for renal replacement therapy, annual per-patient, 373
Part A and Part B, percent of diabetic persons covered by, 595
percentage of cost reimbursed by, increase in, 550
percent of diabetic persons with, 592, 593f
versus nondiabetic persons, 597, 597f
prospective payment system, 555
- Medication(s)**
costs, 606
individuals' out-of-pocket expenses, 607–608, 608t
international comparison, 610
in U.S., 604t
prescription, health insurance coverage for, percent of diabetic persons with, 595, 595f
- MELAS syndrome (mitochondrial myopathy, encephalopathy, lactic acidosis, and stroke-like episodes), 80**
- Men. See Male(s)**
- Meralgia paresthetica, in diabetes, 342**
- Mesangial matrix, alterations, in diabetic nephropathy, 352–353, 353f**
- Metabolic characteristics, of persons with diabetes**
community-based studies, 119, 119f, 130–132, 161a–163a
national data sources, 117–130
and community-based data, comparison, 130–132, 161a–163a
- Metabolic complications, acute, 5, 283–291. See also Diabetic ketoacidosis; Hyperosmolar nonketotic coma; Hypoglycemia; Lactic acidosis**
- Metabolic control. See also Glycemic control**
IDDM mortality risk and, 228–229
risk of congenital malformations in diabetic pregnancies and, 725–726, 726t
spontaneous abortion in diabetic pregnancy and, 723f, 723t, 723–724
- Metabolic factors**
in NIDDM
in Hispanic Americans, 639t, 640, 640t, 659a
in non-Hispanic Americans, 659a
promoting atherosclerosis, 196–197
promoting progression to diabetes, 196
- Metasomatotropic diabetes, 74**
- Metformin therapy, 525, 533**
- Metolazone, diabetogenic effects, 70t**
- Metoprolol, effects on progression of diabetic nephropathy, 369**
- Mexican Americans. See also Hispanic Americans**
alcohol consumption, by diabetes status, age, and sex, 159a
Amerindian admixture in, NIDDM and, 642f, 642t, 642–643
autosomal dominant gene affecting 2-hour post-challenge insulin levels, 643
blood glucose testing in, 138a
blood pressure, by diabetes status, 146a
body mass index

- by duration of NIDDM, age, and sex, 142a
- measured and self-reported, by age and sex, 144a
- by sex, diabetes status, and age, 141a
- cerebrovascular disease mortality in, 248
- diabetic
 - microvascular complications in, 12
 - mortality data for, 645, 646*t*
 - prevalence, 12, 631, 636, 637*t*
 - sociodemographic characteristics, 85, 89, 89*f*, 90–91, 93, 95–97, 99, 103a, 104a–116a
- disability in, 269, 269*f*
- end-stage renal disease in, 12
- with family history of diabetes, by diabetes status and age, 217a
- fasting triglycerides, by diabetes status, 153a, 154a, 156a
- HDL cholesterol, by diabetes status, 154a, 155a
- health insurance coverage, 593
- health status, by diabetes status, 160a
- hyperglycemia in, 12
- hypertension in
 - antihypertensive treatment for, 150a
 - by diabetes status and sex, 147a
 - measured and self-reported, by diabetes status, 148a
 - physician-diagnosed, by age and diabetes status, 149a
- IDDM in, incidence, 40, 42*f*, 664
- insulin levels, genetic factors associated with, 188
- LDL cholesterol, by diabetes status, 153a, 155a
- mean fasting triglycerides, by diabetes status, 151a
- mean HDL cholesterol in, by diabetes status, 151a, 152a
- mean LDL cholesterol in, by diabetes status, 150a, 152a
- mean total cholesterol, by diabetes status, 150a, 151a
- microvascular disease in, 631–632
- mortality in
 - all-cause, 631
 - diabetes-related, 631
- NIDDM in
 - age-standardized prevalence, by percent desirable weight and age, 219a
 - end-stage renal disease in, 361
 - HHANES data, 635, 635*t*, 636*f*
 - and hypertension, by age, 146a
 - metabolic characteristics, by sex,
 - community-based studies, 130–132, 162a
 - prevalence, 1, 219a
 - retinopathy risk in, 308, 309, 309*f*
 - risk factors for, 12
 - obesity in, in NIDDM, by age and sex, 143a
 - parity, by diabetes status, age, and sex, 156a, 157a
 - as percent of nondiabetic population, 29*f*
 - percent screened for diabetes, 29*t*
 - plasma glucose in
 - by age and sex, 134a
 - by diabetes status, 137a
 - proteinuria in, 12
 - retinopathy in, 12, 621*f*
 - smoking and, by diabetes status, age, and sex, 158a
 - subscapular-to-triceps skinfold ratio, by age, sex, and diabetes status, 145a
 - total cholesterol, by diabetes status, 153a, 154a, 155a
 - 2-hour post-challenge plasma glucose in, by age and sex, 136a
 - undiagnosed NIDDM in, 23*t*
 - urine glucose testing in, 137a
 - urine ketone testing in, 138a
 - women with NIDDM
 - HDL cholesterol levels, 131, 164a
 - LDL cholesterol levels, 131, 164a
 - serum triglyceride levels, 131, 164a
- Mexico**
 - diabetes prevalence in, 636, 637*t*
 - IDDM incidence in, 166
- Michigan, IDDM prevalence study, 39*t***
- Micmac Indians, diabetes prevalence in, 686*t***
- Microalbuminuria**
 - definition, 350
 - in diabetes, 6–7
 - heart disease risk with, 440*t*, 440–441, 441*t*
 - in IDDM, 350
 - metabolic control and, 368, 368*f*
 - prevalence, 354, 354*t*
 - as risk factor for death, 357–358
- in NIDDM
 - prevalence, 354–355, 355*t*
 - as risk factor for death, 357–358
- in Pima Indians, duration of disease and, 355, 356*f*
- as risk marker for NIDDM mortality, 252
- Microalbuminuric Collaborative Study Group, blood pressure data, 362**
- Microangiopathy, in diabetes, autopsy studies, 434–435**
- Microvascular disease**
 - genetic associations, 362
 - in Hispanic Americans, 647–655
 - in Mexican Americans, 631–632
- Migrant populations**
 - abnormal glucose tolerance in, 195, 195*t*
 - diabetes in, in industrialized countries versus in homelands, 662, 664
 - NIDDM risk in, 195
- Military, diabetic status of people in, 87**
- Military benefits, percent of diabetic persons covered by, 592, 593*f***
- Military veterans, diabetic status, 85, 99, 116a**
- Minnesota, IDDM prevalence study, 39*t***
- Minnesota Heart Survey, data on reinfarction risk and death after acute MI, 436, 437*t***
- Mithramycin, diabetogenic effects, 70*t***
- Mitochondrial tRNA gene mutation, secondary diabetes with, 70*t*, 78*t***
- MODY. See Maturity-onset diabetes of the young (MODY)**
- Mohawk Indians, diabetes prevalence in, 686*t***
- Molokai, HI, diabetes in, 675**
- Monoamine oxidase inhibitors, side effects, in adult diabetic populations, 514, 515*t***
- Mononeuropathy, in diabetes, 340, 340*f***
- Mononeuropathy multiplex, in diabetes, 342**
- Montreal, Canada, IDDM incidence in, 40**
 - temporal variation in, 44*f*
- Morbidity**
 - short-term, productivity lost due to, costs, 606
 - systemic, costs, 607
- Morphine, diabetogenic effects, 78**
- Mortality. See also Excess mortality**

in acromegaly, 74
 in African Americans, 624–625
 based on death certificates, 624, 624f
 by type of DM, 625
 costs, 607
 in diabetes, 242t, 243f. *See also* Diabetes mellitus, as any listed cause of death; Diabetes mellitus, as underlying cause of death
 age and, 247, 247f, 248, 248f
 age-specific rates, 233
 cohort studies, 236
 death certificate data for. *See* Death certificate data
 methodological problems in, 234–236
 in North American Indians, 689t, 689–690
 race/ethnicity and, 233
 risk factors for, 233
 time trends in, 50
 in diabetic ketoacidosis, 283, 286f, 286–287, 287f
 estimates, 606
 in hemochromatosis, ratios (observed/expected), 74
 in Hispanic Americans, 644–646
 all-cause, in total population, 644–645, 645t
 in diabetic persons, 645–646, 646t, 647t
 in hyperosmolar nonketotic coma, 283, 287
 in IDDM. *See* Insulin-dependent diabetes mellitus (IDDM), mortality in
 influenza, in diabetes, 492
 after lower extremity amputation, 420, 420t
 in lower extremity arterial disease, 406
 in NIDDM. *See* Non-insulin-dependent diabetes mellitus (NIDDM), mortality in
 perinatal. *See* Perinatal mortality
 pneumonia, in diabetes, 492
 productivity lost due to, costs, 606–607
 underreporting, 606

Mucormycosis
 average annual frequency, in hospital discharge summaries, 490t
 in diabetes, 490t, 494, 504

Multicenter Investigation of the Limi-

tation of Infarct Size, 433
 data on reinfarction risk and death after acute MI, 436, 437t

Multiple endocrine neoplasia
 secondary diabetes with, 70t
 type 1, glucose intolerance with, 76

Multiple Risk Factor Intervention Trial (MRFIT)
 cardiovascular mortality in, diabetes and, 439–440
 stroke mortality
 blood glucose levels as predictor, 454
 by diabetes status, 451, 451t

Mumps, IDDM and, 172, 504

Muscular dystrophy, secondary diabetes with, 70t

Myocardial infarct/infarction
 death rate after, 436–438, 438f
 diabetes and, prevalence by type of diabetes, insulin use, and age, 430, 430t
 in Hispanic Americans, 646, 647t, 648t
 natural history, in diabetic versus nondiabetic persons, 436–438, 437t, 438f
 in North American Indians, 692
 prognosis for, in diabetic versus nondiabetic persons, 436–438, 438f

N

Nagi, Saad, 260

National Ambulatory Medical Care Survey (NAMCS), 2, 542

coding, 544
 in cost-of-illness estimates, 603
 data on diabetes screening methods, 22
 health insurance information from, 591–592
 problems with, 603
 strengths and weaknesses, 542

National Center for Health Statistics (NCHS), 581

National Diabetes Data Group (NDDG)

classification of diabetes, 15, 16t, 16–17
 definition of impaired glucose tolerance, 55
 diagnostic criteria for diabetes, 17–18, 18t, 51
 versus WHO criteria, 18–19

diagnostic criteria for gestational diabetes, 704–705, 705t
 diagnostic criteria for impaired glucose tolerance, 19, 20t

National Health and Nutrition Examination Survey (NHANES)

data on incidence and prevalence of diabetes, 1

first (NHANES I)

cataract data, 322, 322f
 coronary heart disease data, 435, 436t

data on visual impairment, 296, 297f

disability data from, 278

Epidemiologic Followup Survey (NHEFS), diabetes mortality data, 236–237

followup, data on diabetes as risk factor for stroke, 452, 452t

IDDM prevalence study, 39t

NIDDM study, characteristics of persons with NIDDM, 2–3

reflex changes in, by diabetes status, 344f, 345, 345f

second (NHANES II), 117

cataract data, 321–322, 322f

data on diabetes and digestive diseases, 460, 461t

glaucoma data, 326, 326f

infection data, 488, 488t

metabolic characteristics in NIDDM, by race/ethnicity, 161a

methods, 118

NIDDM prevalence in, race/ethnicity differences in, 182

prevalence and incidence determination from, 48

urinary tract infection data, 488, 488t

third (NHANES III), data on diabetic retinopathy risk factors, 308, 309, 309f

National Health Interview Survey (NHIS), 117, 519, 528, 555–556

1973, IDDM prevalence study, 39t

1976, IDDM prevalence study, 39t

1979–81, IDDM prevalence study, 39t
 1989, 85–87, 118

absenteeism data from, 273, 281a

cataract data, 321–322, 322t

Current Health Topics on diabetes and digestive diseases, 458

data on diabetes and digestive dis-

- eases, 457–460, 458t–459t
 disability data from, 267, 269, 269f, 270, 270t, 281a
 NIDDM screening data from, 2
 prevalence of neuropathy in, 343f, 343–345, 344f
 urinary tract infection data, 487t, 488
 vision problem data, 294–296, 296t
 1989–92, IDDM prevalence study, 39t
 ambulatory medical care data, 541–542
 core questionnaire, 555, 558
 in cost-of-illness estimates, 603
 diabetes questionnaire, 542, 555–556, 604
 disability data from, 261, 263f, 263–265, 264f, 264t, 281a
 time trends in, 271, 271f, 271t
 health insurance information from, 591
 hospitalization questions, 555
 hospitalizations in past year
 of adults with IDDM and NIDDM, 559, 559f, 560–561, 561f, 566a, 568a
 by complications and duration of diabetes, 559, 560f, 567a
 by insulin treatment, 560, 560f, 567a
 multiple, 560–561, 561f, 568a
 by race, 560, 560f, 566a, 567a
 by sex, 559f, 559–560
 IDDM definition, 556
 incidence of diabetes mellitus in, 1
 interview data, 555
 limitations, 555–556
 NIDDM definition, 556
 NIDDM incidence data, 53–54
 NIDDM prevalence in, 49, 49f, 49t, 50f, 50t
 time trends in, 49–51, 50f, 51f, 63a, 64a, 65a, 66a
 ophthalmic care data, 328, 328t, 329t
 prevalence and incidence determination from, 1, 47–48
 in productivity-loss estimates, 603
 protocol for, 47–48
 Supplement on Aging, disability data from, 265, 266, 267–268, 268f
- National High Blood Pressure Education Program Working Group, 455**
- National Home Health and Hospice Care Survey, 581**
- National Hospital Discharge Surveys (NHDS) data, 554. See also Hospital discharge data; Hospital discharges**
 coding, 554
 on cost of hospitalization, 562
 on cost-of-illness estimates, 603
 on diabetes and amputation, 411, 414, 414t
 on diabetes and digestive diseases, 460–464, 462t–463t
 on diabetes diagnosis, 555–556
 on foot ulcers, 410t, 410–411, 411f
 on hospitalization estimates, 605
 on infection diagnoses, 489, 490t
 on LEAD prevalence, 403, 404t
 on length of stay, 561f, 561–562, 569a
 limitations, 410, 554–555
 on lower extremity ulcer prevalence, 409
 on neuropathy prevalence, 345, 345t
 problems with, 603
 on reinfarction risk and death after acute MI, 436, 437t
- National Medical Care Expenditure Survey (NMCES)**
 in cost-of-illness estimates, 603
 health insurance information from, 591
- National Medical Care Utilization and Expenditure Survey (NMCUES), in hospitalization estimates, 605**
- National Medical Expenditure Survey (NMES)**
 1987
 in cost-of-illness estimates, 603
 prevalence estimate, 604, 608–609
 problems with, 604
 ambulatory medical care visits, 543
 data on long-term care for diabetes, 10–11
 health insurance information from, 591
 NMES-2, 571, 572, 581, 587a–589a
- National Mortality Followback Survey (NMFS), 689**
 diabetes mortality data, 236, 237f, 250
- National Nursing Home Survey (NNHS)**
 1985, 86
 in cost-of-illness estimates, 603
 data on disability prevalence, 266
 problems with, 603
- Native Americans. See also Alaska natives; North American Indians**
 community-based diabetes investigation among, 119, 130–132, 162a–163a
 diabetic, metabolic characteristics, by sex, in Strong Heart Study, 130–132, 163a
 end-stage renal disease in, 360, 361t
 mortality in, diabetes as underlying cause of death for, 249, 249t, 250
 NIDDM in
 complications, 13
 end-stage renal disease in, 361
 incidence, 54
 prevalence, 1, 13, 52–53, 56t–58t
 women with NIDDM
 HDL cholesterol levels, 131, 164a
 LDL cholesterol levels, 131, 164a
 serum triglyceride levels, 131, 164a
- Nauru Islanders, albuminuria in, 355**
- Navajo**
 diabetic
 end-stage renal disease in, 690
 obesity and, 688
 pregnancy in, 693
 prevalence, 685t
 gestational diabetes in, 693
 hypertension in, 692
 lower extremity amputation in, 691
- NCHS. See National Center for Health Statistics**
- Necrolytic migratory erythema, with glucagonoma, 76**
- Necrotizing cellulitis, in diabetes, 504**
- Necrotizing fasciitis, in North American Indians, 691**
- Nephropathy. See Diabetic nephropathy**
- Neurogenic bladder, prevalence, in National Hospital Discharge Survey, 345t**
- Neuropathy. See also Autonomic neuropathy**
 alcohol consumption and, 525
 costs, attribution to diabetes, 602
 in diabetes
 classification, 339, 340t
 clinical, 339, 340t
 definition, 339
 diagnostic criteria for, 339
 diffuse somatic, 339–340, 340t
 distal symmetric sensorimotor type, 339–340, 340t
 duration of disease and, 343, 343f, 344

- gastrointestinal symptoms and, 513, 513t
- glycemic control and, 339
- glycosuria and, 344, 344f
- hypertension and, 344, 344f
- in National Health Interview Survey (1989), 343f, 343–345, 344f
- population-based studies, 339
- prevalence, 339, 341, 341f
- primarily large-fiber, 339, 340t
- primarily small-fiber, 339, 340t
- pseudotabes form, 339
- race and, 344, 344f
- risk factors for, 343, 343f, 344
- Rochester Diabetes Project, 340, 340f
- Rochester Diabetic Neuropathy Project, 340–342
- San Luis Valley Study, 342f, 342–343
- sex distribution, 343f, 343–344
- staging, 339, 340t
- subclinical, 339, 340t
- types, 339
- in Hispanic Americans, 654f, 654t, 654–655
- hypoglycemia and, 290
- in IDDM, 6
- intensive insulin therapy and, in IDDM, 519, 526, 526f, 527f
- lower extremity, foot ulcers and, 412–413, 413t
- in NIDDM, 6
- in nondiabetic population, 29f
- in persons screened for diabetes, 29t
- in pregnancy, maternal risks with, 729
- prevalence
- clinic, hospital, cohort, and convenience samples, 345–347
 - in Diabetes Control and Complications Trial, 345–346, 346f
 - in National Health and Nutrition Examination Survey, by diabetes status, 344f, 345, 345f
 - in National Hospital Discharge Survey, 345, 345t
 - in Pittsburgh Epidemiology of Diabetes Complications Study, 346–347
- New Delhi, diabetes prevalence in, 674, 674t**
- New Haven, CT, coronary heart disease data, 435, 435t, 436t**
- New Mexico**
- Hispanics in, diabetes prevalence in, 635, 635t
 - mortality data for diabetic persons, 645, 646t
- New World syndrome, 691**
- Nez Perce Indians, diabetes prevalence in, 685t**
- NHANES. See National Health and Nutrition Examination Survey (NHANES)**
- NHANES I. See National Health and Nutrition Examination Survey, first**
- NHANES II. See National Health and Nutrition Examination Survey, second**
- NHANES III. See National Health and Nutrition Examination Survey, third**
- NHDS. See National Hospital Discharge Survey**
- NHEFS. See First National Health and Nutrition Examination Survey Epidemiologic Follow-up Survey**
- NHIS. See National Health Interview Survey**
- Nicotinamide, in prevention or delay of IDDM, 170**
- Nicotinic acid**
- diabetogenic effects, 70t, 77t, 78
 - sites of action, 77t
- NIDDM. See Non-insulin-dependent diabetes mellitus (NIDDM)**
- Nitrate(s), in drinking water, IDDM incidence and, 170**
- Nitrosamines**
- diabetogenic effects, 70t
 - dietary, IDDM incidence and, 170
- NMES-2. See National Medical Expenditure Survey**
- Nocturnal penile tumescence, in diabetes, psychological factors affecting, 507, 513**
- Nondiabetic offspring, of NIDDM patients, albuminuria in, 197**
- Nondiabetic population**
- alcohol consumption and, by age, sex, and race/ethnicity, 159a
 - cholesterol abnormalities in, by age, sex, and race/ethnicity, 128, 153a, 154a, 155a
 - disability in
 - activity limitations and, 275–276, 276f
 - by sex and age, 281a
 - distribution
 - by age, 87, 88f, 102a–103a
 - among immigrants, by years of living in U.S., 96–97, 112a
 - by cohabitation status, 93, 93f, 94f, 108a
 - by employment status, 97, 98f, 113a
 - by family income, 95–96, 96f, 97f, 111a
 - by family size, 109a
 - by marital status, 92f, 92–93, 107a
 - by race/ethnicity, 89, 89f
 - regional, 105a
 - by size (in thousands) of urban population, 91, 91f, 106a
 - by type of employer, 99, 115a
 - by urban/rural residence, 91, 91f, 106a
 - by usual activity, 97–98, 114a
 - by years of education, 94f, 94–95, 95f, 110a
 - dyslipidemia in, by age, sex, and race/ethnicity, 128, 153a–156a
 - with family history of diabetes, by age, sex, and race/ethnicity, 217a, 218a
 - HDL abnormalities in, by age, sex, and race/ethnicity, 128, 154a, 155a
 - HDL cholesterol in, by age, sex, and race/ethnicity, 128, 151a, 152a
 - health status in, 129–130, 130a, 160a
 - by age, 160a
 - by race/ethnicity, 160a
 - by sex, 160a
 - hypertension in
 - measured and self-reported, by age, sex, and race/ethnicity, 148a
 - physician-diagnosed, by race/ethnicity and age, 149a
 - LDL abnormalities in, by age, sex, and race/ethnicity, 128, 153a, 155a
 - LDL cholesterol in, by age, sex, and race/ethnicity, 128, 150a, 152a
 - mean total cholesterol in, by age, sex, and race/ethnicity, 127–128, 150a, 151a
 - military status (percent of population), 85, 99, 116a
 - parental history of diabetes and
 - by age, 140a
 - by race/ethnicity, 140a

- by sex, 140a
 - parity in, by age, sex, and race/ethnicity, 128*f*, 128–129, 156a–157a, 158a
 - proinsulin levels in, 197
 - smoking and, by age, sex, and race/ethnicity, 158a
 - smoking in, by age, sex, and race/ethnicity, 129, 129*f*, 158a, 159a
 - triglycerides in
 - abnormalities, by age, sex, and race/ethnicity, 128, 154a, 156a
 - by age, sex, and race/ethnicity, 128, 151a, 153a
 - who are immigrants (percent), 96–97, 112a
- Nondihydropyridine calcium slow-channel inhibitors, for microproteinuria/macroproteinuria, 534**
- Non-insulin-dependent diabetes mellitus (NIDDM), 1**
- activity limitations in, versus nondiabetic populations, 267, 268*f*
 - age and, 181, 181*f*
 - albuminuria and, 6, 197, 354
 - prevalence, 354–355, 355*t*
 - as risk factor for death, 357–358
 - alcohol consumption and, 3, 191, 196
 - by age, sex, and race/ethnicity, 159a
 - ambulatory care visits for, frequency, 547, 547*f*, 547*t*
 - in Asian population, 664–674
 - asymptomatic, screening tests for, 25–27, 28*t*
 - behavioral factors associated with, modification, 201–202
 - blood glucose testing in
 - by age, 138a
 - by race/ethnicity, 138a
 - by sex, 138a
 - blood pressure and, 124–127, 125*f*, 126*f*, 146a, 147a–148a
 - body fat distribution and, 193
 - body mass index in, by duration of disease, age, sex, and race/ethnicity, 142a
 - bronchitis in, 487*t*
 - cardiovascular disease in, 429
 - carpal tunnel syndrome in, 341*f*, 341–342
 - cataracts in, 6
 - with β -cell autoimmunity, 180
 - β -cell autoimmunity and, 201
 - β -cell failure in, 179, 180
 - characteristics, 16*t*
 - cholesterol abnormalities in, by age, sex, and race/ethnicity, 128, 153a, 154a, 155a
 - classification, 613
 - clinical course, 3
 - clinical manifestations, oral, 504
 - comorbidity
 - with dyslipidemia, 527
 - with hypertension, 527
 - with obesity, 527
 - complications, 17
 - at diagnosis, 17–18
 - prevalence, 28, 29*f*, 29*t*, 30*f*, 30*t*
 - corneal disease in, 328
 - development, central obesity and insulin resistance in, 676*f*
 - dextran clearance profiles in, 353, 353*f*
 - diabetic ketoacidosis in, 283
 - diabetic nephropathy in, familial clustering, 361–362, 362*f*
 - diabetic retinopathy in, 5, 23–24, 24*f*
 - diagnosis, 15, 16–17
 - in asymptomatic patients, 20*f*, 20–21, 21*t*
 - by chance, 20*f*, 20–21, 21*t*
 - circumstances for, 20*f*, 20–21, 21*t*
 - incidence, 53*f*, 53*t*, 53–54, 54*f*, 67a
 - tests used for, 21, 21*f*, 21*t*, 22*t*
 - diagnostic criteria, 1, 15, 17, 117
 - in NHANES II, 118
 - diagnostic criteria for, 614*t*
 - diet and, 190–191
 - dietary therapy and, 201–202
 - disability in, 5
 - activity limitations and, 263, 263*f*, 264*f*, 264*t*, 275–276, 276*f*, 281a
 - demographic factors affecting, 267
 - health perceptions and, 277, 277*f*
 - health profiles and, 278
 - late complications of diabetes and, 270, 270*t*
 - prevalence, 259, 263, 263*f*
 - by sex and age, 281a
 - distribution
 - by age, 85, 87, 88*f*, 102a–103a
 - by age, sex, and race, 88, 88*f*
 - by age at diagnosis, sex, and race, 90, 90*f*
 - by age at onset, 85
 - among immigrants, by years of living in U.S., 96–97, 112a
 - by cohabitation status, 93, 93*f*, 94*f*, 108a
 - by duration of disease, 85, 89, 90*f*, 104a
 - by employment status, 85, 97, 98*f*, 113a
 - by family income, 85, 95–96, 96*f*, 97*f*, 111a
 - by family size, 85, 93, 109a
 - by immigrant status (percent of population), 96–97, 112a
 - by marital status, 85, 92*f*, 92–93, 107a
 - by race/ethnicity, 85, 89, 89*f*
 - regional, 85, 90, 91*f*, 105a
 - by sex, 85, 89, 89*f*
 - by size (in thousands) of urban population, 85, 91, 91*f*, 106a
 - by type of employer, 85, 99, 115a
 - by urban/rural residence, 91, 91*f*, 106a
 - by usual activity, 97–98, 114a
 - by years of education, 85, 94*f*, 94–95, 95*f*, 110a
- duration
- diet and, 521, 521*t*, 540a
 - insulin therapy and, 521, 521*t*
 - oral hypoglycemic agents and, 521, 521*t*
- duration before diagnosis, 2, 15, 23–24, 24*f*
- dyslipidemia in, 3
 - by age, sex, and race/ethnicity, 128, 153a–156a
- in elderly, clinical implications, 581
- employment status and, 5
- end-stage renal disease and, 358
- incidence, 360
 - racial differences in, 360–361, 361*f*
- epidemiologic studies, methodological problems in, 429
- etiology, 3–4, 17
 - alternative models, 201
 - behavioral risk factors and, 199*f*, 199–200
 - genetic susceptibility and, 199*f*, 199–200
 - insulin resistance followed by β -cell failure, 199*f*, 199–200
 - integrated model, 198–201
 - latent β -cell defect model, 200*f*, 200–201
 - lifestyle changes and, 676
 - two-step model, 199*f*, 199–200
- excess mortality in, 237–241, 238*t*–240*t*
- risk markers, 252

exercise programs and, 201–202
 family history of diabetes and, 117, 121–122, 122*f*, 139*a*, 181, 183, 215*a*–219*a*, 216*a*
 by age, sex, and race/ethnicity, 217*a*, 218*a*
 fasting plasma glucose in, 120, 120*f*, 137*a*
 foot ulcer incidence in, 412
 gastrointestinal symptoms in, 465*t*, 465–466
 gene mutations in, 79–80
 genetic factors associated with, modification, 201
 genetics, 4, 180, 182–189
 adenosine deaminase gene and, 186*t*
 amylin gene and, 185, 185*t*, 186*t*
 apolipoprotein APOA1 gene and, 185*t*
 apolipoprotein APOA2 gene and, 185*t*
 apolipoprotein APOB gene and, 185*t*
 apolipoprotein APOD gene and, 185*t*
 association studies, 184*t*–185*t*, 184–185
 candidate genes, 184, 184*t*–185*t*, 185–188, 196
 glucokinase (GCK) gene and, 70*t*, 78*t*, 79–80, 185*t*, 185–187, 186*t*, 187*t*
 glucose transporter 1 gene and, 184*t*, 185, 186*t*
 glucose transporter 2 gene and, 185, 185*t*, 186*t*, 187
 glucose transporter 4 gene and, 185, 185*t*, 187
 glycogen synthase gene and, 185*t*, 187–188
 insulin gene and, 184*t*, 185, 186*t*
 insulin receptor gene and, 184*t*, 185, 186*t*
 insulin signal transduction pathway genes in, 188
 islet amyloid peptide gene and, 185, 185*t*, 186*t*
 linkage studies, 185, 186*t*
 lipoprotein lipase gene and, 185*t*
 mode of inheritance, 189
 glaucoma in, 6
 glomerular filtration rate in, 351*f*, 351–352
 HDL in
 abnormalities, by age, sex, and race/ethnicity, 128, 154*a*, 155*a*
 by age, sex, and race/ethnicity, 128, 128*f*, 151*a*, 152*a*
 health status in, 129–130, 130*f*, 160*a*
 by age, 160*a*
 by race/ethnicity, 160*a*
 by sex, 160*a*
 heart disease in
 microalbuminuria and, 440–441, 441*t*
 prevalence, 430, 430*t*
 heterogeneity, 179–181
 high blood glucose in, 120–121, 121*f*, 138*a*
 in Hispanic Americans
 family history of diabetes and, 643
 HHANES data, 635, 635*t*, 636*f*
 mortality in, 645–646, 647*t*
 risk factors for, 638–643, 639*t*
 San Antonio Heart Study prevalence data, 633, 634*f*, 634*t*
 San Luis Valley Diabetes Study prevalence data, 633, 634*t*
 HLA associations, insulin-resistant variant and, 620
 hospitalizations, considered to be related to diabetes, 554
 hyperdynamic circulation and, 197
 hypertension in, 3
 antihypertensive treatment for, 117, 127, 127*f*, 150*a*
 measured and self-reported, by age, sex, and race/ethnicity, 148*a*
 physician-diagnosed, 127, 127*f*, 149*a*
 by race/ethnicity and age, 149*a*
 hypoglycemia in, 290
 IGT and, 620
 incidence, 47–67, 53*f*, 53*t*, 53–54, 54*f*, 67*a*, 198, 601
 in African Americans, 618
 age distribution, 53, 53*f*, 53*t*, 54*f*
 age-related increase in, 193
 community studies, 49, 55, 59*t*–60*t*
 in Hispanics, 637–638, 638*f*, 638*t*
 national surveys, 47–49
 after previous gestational diabetes, 712, 712*t*
 sex distribution, 53, 53*f*, 53*t*
 time trends in, 49–51, 50*f*, 51*f*, 53–54, 54*f*, 63*a*, 64*a*, 65*a*, 66*a*
 insulin resistance and, 179, 180, 620
 insulin-resistant variant, in African Americans, 620
 insulin therapy for. *See* Insulin therapy
 insulin-treated, prevalence, 15, 17, 17*t*
 intensive insulin therapy for, risks associated with, 527
 islet amyloid polypeptide (amylin) and, 197–198
 kidney morphology in, 352*f*, 352–353
 LDL in
 abnormalities, by age, sex, and race/ethnicity, 128, 153*a*, 155*a*
 by age, sex, and race/ethnicity, 128, 128*f*, 150*a*, 152*a*
 life expectancy in, 241*t*, 241–243
 lower extremity amputation risk and, 418
 main type, 180
 mean age at diagnosis, 2, 85, 105*a*
 mean total cholesterol in, by age, sex, and race/ethnicity, 127–128, 128*f*, 150*a*, 151*a*
 metabolic factors associated with, modification, 202
 metabolic variables in, in Hispanic and non-Hispanic Americans, 659*a*
 microalbuminuria in, as risk factor for death, 357–358
 in migrant populations, prevalence, 195, 195*t*
 military status (percent of population) and, 85, 99, 116*a*
 mortality in, 4, 236–237, 237*f*. *See also* Non-insulin-dependent diabetes mellitus (NIDDM), excess mortality in
 adjusted for multiple risk factors, 240
 in African Americans, 625
 age-adjusted risk, 237–241, 241*f*
 age and, 249*t*, 249–251
 age at onset and, 241, 242*t*, 242–243
 age-specific rates, 233
 average annual death rate, 237
 causes of death, 233, 242*t*, 243*f*, 243–249
 current age and, 241, 242, 242*t*
 with duration of disease, 241
 hospital, clinic, and worksite studies, 239*t*–240*t*, 240–241
 with increasing age, 241, 242*t*, 242–243
 insulin therapy and, 241
 microalbuminuria and, 440, 440*t*

versus mortality in nondiabetic population, 233
 in newly diagnosed cases, 241
 in North American Indians and Alaska natives, 689*f*, 689*t*, 689–690
 population-based studies, 238*t*–240*t*, 240–241
 race/ethnicity and, 233, 249*t*, 249–251
 reduction, 233–234
 risk factors for, 233, 238*t*–240*t*, 241, 244*t*–246*t*, 251*f*, 251–252
 risk markers, 252
 sex and, 241, 242*t*, 242–243, 249–250
 by urinary albumin concentration, 357, 358*f*
 neuropathy in, 6
 prevalence, 339, 341, 341*f*
 in San Luis Valley Study, 342*f*, 342–343
 normo- or hypoinsulinemic, genetic defects leading to, 201
 in North American Indians. *See* North American Indians, NIDDM in
 nutritional therapy for. *See* Nutritional therapy
 obesity and, 3, 193–194, 196, 219*a*, 220*a*
 genetic associations, 193–194, 196
 sex and racial/ethnic distribution, 123*f*, 123–124, 143*a*
 sex distribution, 117
 pancreatic cancer and, 457, 475
 parental history of diabetes and
 by age, 140*a*
 by race/ethnicity, 140*a*
 by sex, 140*a*
 parity in, by age, sex, and race/ethnicity, 128*f*, 128–129, 156*a*–157*a*, 158*a*
 pathogenesis, 4, 17
 pathomechanisms, 179
 patient characteristics in, 520*t*
 periodontal disease in, 502–504
 persons with
 health status, 3
 metabolic characteristics, 2–3
 physical characteristics, 2–3
 smoking habits, 3
 sociodemographic characteristics, 2
 phenotypes, genetic modeling, 189, 189*t*
 phosphoenol pyruvate carboxykinase regulation in, 188
 physical activity and, 620
 physical inactivity and, 191–193, 192*t*, 196
 preclinical phase, 23–24
 in pregestational diabetes, prevalence, 721–722
 prevalence, 1, 17, 17*t*, 23, 23*f*, 47–67
 in African Americans, 618
 by age and sex, 49, 49*f*, 49*t*, 50*f*, 50*t*
 age-standardized, by percent desirable weight and race, 219*a*
 by body mass index and age, 219*a*
 community studies, 49, 55, 56*t*–58*t*
 ethnic differences in, 181–182, 182*f*
 by family history of diabetes and age, 219*a*
 female/male ratio, race/ethnicity and, 182, 182*f*
 geographic variance in, 181–182, 182*f*
 in Hispanic Americans, 631–637
 in Hispanics versus non-Hispanic whites, 637, 637*t*
 in Mauritius, 668–669, 669*t*
 national surveys, 47–49
 in nursing home populations, 572
 by obesity level, age, and sex, 220*a*
 in pregnant women, 721–722
 racial differences in, 51*f*, 51–53, 52*f*, 52*t*, 63*a*, 65*a*, 66*a*
 sex differences in, 50*f*, 51, 56*t*–58*t*
 worldwide interpopulation differences in, 181–182, 182*f*
 prevention, 201–202
 effectiveness of intervention, 202
 proinsulin levels in, 197
 proliferative retinopathy with, risk, race/ethnicity and, 308–309, 309*f*
 proteinuria in, 6, 354
 duration of disease and, 356, 357, 357*f*
 prevalence, 354–355, 355*t*
 race/ethnicity and, 181*f*, 181–182, 182*f*
 racial admixture and, 183
 racial distribution, 2
 with rare genetic syndromes, 181
 related factors, 667
 renal disease in, metabolic control and, 368–369
 renal plasma flow in, 351, 351*f*
 risk
 assessment, 199–201
 categorization, 199
 genetic-environmental interactions and, 196
 gestational diabetes and, 198–199
 impaired glucose tolerance and, 198, 198*t*
 intermediate categories, 198–199
 parity and, 194
 prediction, based on multiple regression equations, 199
 pregnancy and, 194
 socioeconomic status and, 194–195
 thinness at birth and, 194
 risk factors for, 2, 3–4, 15–16, 27, 54, 179–220
 accurate measurements, 182
 in African Americans, 619–620
 behavioral, 189–196
 demographic, 181–182
 genetic, 182–189
 in Hispanic Americans, 638–643, 639*t*
 integration in model of causation, 198–201
 lifestyle, 189–196
 metabolic, 196–198
 in nondiabetic adults, 30*f*
 number, and frequency of screening, 30, 31*f*
 prevalence, 28, 29*f*, 29*t*, 30*f*, 30*t*
 prevalence of undiagnosed NIDDM and, 30*f*
 risk markers for, 4
 screening for, 2, 15–16
 controversies in, 25
 effectiveness, 25
 by fasting plasma glucose, 26*f*, 26*t*, 26–27, 27*t*, 28*t*, 36*a*
 by glycosylated hemoglobin, 27, 28*t*
 in high-risk groups, 29*t*, 29–30, 30*t*, 31*f*
 by oral glucose challenge, 21*t*, 22*t*, 25–26, 26*t*
 yields, in high-risk populations, 31*t*, 31–32
 sex distribution, 2, 182, 182*f*
 sinusitis in, 487*t*
 smoking and
 by age, sex, and race/ethnicity, 129, 129*f*, 158*a*, 159*a*
 by age and sex, 159*a*
 sulfonylureas for, 525–526
 patient selection for, 526
 therapies for. *See also* Insulin therapy; Nutritional therapy; Oral hypo-

- glycemic agents; Therapy characteristics, 522, 522t usage, 523f, 540a
- triglyceride abnormalities in, by age, sex, and race/ethnicity, 128, 154a, 156a
- twin studies, 183t, 183–184, 196 concordance rate, 4
- 2-hour post-challenge plasma glucose in, 120, 121f, 137a
- undiagnosed, 15, 17
- in African Americans, 12, 23t, 617f
- blood pressure and, 117, 124–127, 125f, 126f, 146a, 147a–148a
- body mass index and, 122f, 123, 141a
- complications, 17–18, 24f, 24–25, 25f
- detection, 15–16, 31t, 31–32
- dyslipidemia in, by age, sex, and race/ethnicity, 128, 153a–156a
- family history of diabetes and, 117, 121, 122f, 139a, 217a, 218a
- in females, 23t, 156a, 158a
- in high-risk groups, prevalence, 28, 30f
- LDL cholesterol in, by age, sex, and race/ethnicity, 24, 128, 150a, 152a
- morbidity with, 55
- number of cases in U.S., 1
- prevalence, 23, 23f, 36a, 47, 52f, 52t, 54f, 54–55, 219a, 613
- by race, 12, 23, 23f
- by risk factor(s), 30f
- screening for, 2, 23–25, 25–27, 28t
- by sex, 23, 23f
- treatable risk factors, 24f, 24–25, 25f
- triglycerides in, by age, sex, and race/ethnicity, 128, 151a, 153a
- in women of childbearing age, by race/ethnicity, 720, 721f
- urinary tract infection in, 487t, 488
- urine glucose testing in, 120–121, 121f, 138a
- by age, 137a
- by race/ethnicity, 137a
- by sex, 137a
- urine ketone testing in, 121
- by age, 138a
- by race/ethnicity, 138a
- by sex, 138a
- weight control and, 201–202
- in women of childbearing age, by race/ethnicity, 720, 721f
- women with, parity, by age and race, 158a
- Nonsteroidal antiinflammatory drugs**
- ESRD risk in diabetes and, 366, 367t
- nonaspirin, chronic renal disease risk with, 366, 366t
- Nonwhites. See also Alaska natives; Blacks; Hispanic Americans; North American Indians**
- with diabetes, sociodemographic characteristics, 85, 89, 89f, 90–91, 93, 95–97, 99, 103a, 104a–116a
- IDDM in, distribution, by age, 102a
- North American Indians. See also specific tribe or nation**
- cardiovascular disease in, 692
- coccidioidomycosis in, 691
- diabetes education programs for, 694
- diabetes in, 673–674
- end-stage renal disease in, 690, 690f
- mortality data for, 646t
- prevalence, 683–687, 684f, 684t
- by region, 685t–686t, 687
- psychosocial and cultural studies, 694t, 695
- in southern versus northern railway doctors, 673
- diversity, 683
- gallbladder disease in, 691–692
- gestational diabetes in, 693, 709, 709t
- health promotion in, 694
- hypercholesterolemia in, 692
- hypertension in, 692
- IDDM in, 683
- incidence, 165
- infants of diabetic mothers
- congenital abnormalities in, 693
- diabetes in, 693, 693f
- obesity in, 693
- infections in, 691
- ischemic heart disease in, 692
- lower extremity amputation in, 690–691
- risk factors for, 691
- survival after, 691
- median age, 683
- myocardial infarction in, 692
- necrotizing fasciitis in, 691
- NIDDM in, 683
- in children, 693
- determinants, 687–689
- diet and, 688–689
- genetics, 687f, 687–688
- lifestyle and, 688
- mortality from, 689t, 689–690
- obesity and, 687f, 688, 688f
- pathogenesis, 688–689
- primary prevention, 694
- risk factors for, 683
- obesity in, diabetes and, 683
- percent screened for diabetes, 29t
- periodontal disease in, 691
- pregnancy in, preexisting diabetes and, 693
- complications, 693
- preventive health services for, 693–694
- retinopathy in, 690, 691t
- sociodemographic characteristics, 683
- stroke in, 692
- mortality from, 449, 449t
- tuberculosis in, 691
- prevention, 694
- North Dakota, IDDM in**
- incidence
- by sex, 43t
- temporal variation in, 43f, 44f
- prevalence study, 39t
- North Dakota/South Dakota, Native Americans in**
- metabolic characteristics, by sex, in Strong Heart Study, 130–132, 163a
- women with NIDDM
- HDL cholesterol levels, 131, 164a
- LDL cholesterol levels, 131, 164a
- serum triglyceride levels, 131, 164a
- Northern Cheyenne Indians, diabetes prevalence in, 685t**
- Nortriptyline, efficacy, in diabetics, 507**
- Norway, IDDM incidence in, temporal variation in, 44f**
- Nurses' Health Study**
- coronary heart disease data, 435, 435t, 436t
- stroke risk data, 451–452
- Nursing facilities. See Nursing homes**
- Nursing homes, 571–572**
- care environment in, 572–573
- costs, 606
- international comparison, 609
- in U.S., 604t
- costs and sources of payment in, by diabetes status, 579t, 579–581, 580f, 580t
- diabetes management in, improvements in, 583–584, 590a
- diabetic residents in, 10–11

diabetic status of people in, 86
dietary departments in, 583
living arrangements prior to admission, by diabetes status, 575, 575t
residents
 chronic conditions in, 575–577, 577f, 582–583
 demographic characteristics, 573–575, 574t
 diabetes in, 572t, 573, 573f
 diabetes-related conditions in, 575–576
 insurance coverage for, 579t, 579–581
 length of stay, 578–579, 579t
 limitations in activities of daily living, 578, 578f, 578t
 Medicaid for, 579, 580f
 medical conditions in, 575–577, 576t, 577t, 577f, 587a–589a
 mortality, 578–579, 579t
 non-diabetes-related conditions in, 576–577
 vision and hearing status, 577, 577t

Nutrition, risk of IDDM and, 170–171

Nutritional therapy

for diabetes, 519, 522–525
 difficulties, 523, 524t
duration of diabetes and, 521, 521t
for IDDM, 522–525
 in children, 519, 523
 usage, 520, 520t
for NIDDM, 522–525
 with obesity, 519, 523–524
 usage, 520, 520t, 521t

O

Obesity

abdominal, NIDDM and, 193
 mortality in, 251
in African Americans, NIDDM and, 619
central
 adverse metabolic consequences, 677
 by age, sex, and diabetes status, 124, 124f, 145a
 community-based studies, 130, 131f
 diabetes and, 671
 insulin resistance syndrome and, 676f
 NIDDM and, 193, 251, 676f
definition, 123

in diabetics, community-based studies, 130, 131f
genetic component, 194
in impaired glucose tolerance, 117
in infants of diabetic mothers, in North American Indians, 693
measurement, with body mass index, 619
in NIDDM, 3, 123f, 123–124, 193–194, 196, 219a, 220a
 genetics, 193–194
 in Hispanic Americans, 638–639, 639f, 639t
 prevalence, by sex and age, 220a
 sex and racial/ethnic distribution, 123f, 123–124, 143a
 sex distribution, 117
in North American Indians, diabetes and, 683
nutritional therapy for, in NIDDM, 523–524
in Pima Indians, energy metabolism in, 689
race and, by diabetes status, 619t
refractory morbid
 appetite suppression for, 524
 gastric bypass for, 524
risk, after fetal macrosomia, 726
as risk factor in North American Indians, 687f, 688, 688f
risk factors for, 194
steatosis in, 469
in undiagnosed NIDDM, 24

Obesity-associated insulin resistance, secondary diabetes with, 70t, 80

OBRA. See Omnibus Budget Reconciliation Act

Occupational disability. See Work disability

OGTTs. See Oral glucose tolerance test(s)

Ojibwa Indians

diabetes prevalence in, 686t
hypertension in, 692

Oklahoma Indians

diabetic
 cerebrovascular disease mortality in, 248
 end-stage renal disease in, 690
 metabolic characteristics, by sex, in Strong Heart Study, 130–132, 163a
 retinopathy in, 319–320, 690, 691t
lower extremity amputation in, 691
NIDDM in

 genetics, 687–688
 mortality from, 689–690
 proliferative retinopathy risk with, 308, 319–320
women with NIDDM
 HDL cholesterol levels, 131, 164a
 LDL cholesterol levels, 131, 164a
 serum triglyceride levels, 131, 164a

Omaha Indians, diabetes prevalence in, 686t

Omnibus Budget Reconciliation Act (OBRA), 571, 583

Oneida Indians, diabetes prevalence in, 686t

Ophthalmic care

in diabetes, 6
frequency, by age and diabetes status, 328, 328t, 329t

Opiates

diabetogenic effects, 70t, 77t, 78
sites of action, 77t

Oral contraceptives

diabetogenic effects, 70t, 77, 77t
sites of action, 77t

Oral glucose tolerance test(s), 1

in diagnosis, 21, 21f, 21t, 22t
frequency, 15
 annual, 22t, 22–23
in gestational diabetes, 22t, 22–23, 704, 704t, 706–708
 composition of challenge, 707
 conditions of testing, 706
 thresholds, 706
 timing of screening test, 707, 707t
indications for, 20
in NHANES II, method, 118
number performed annually, 2, 22, 22t
procedure for, 20
in screening, 22, 22f
 for NIDDM, 21t, 22t, 25–26, 26t
 and percent requiring retesting (PRR) for FPG, 27, 27t

Oral hypoglycemic agents, 519

for diabetes mellitus, 525–526
in elderly, 582
duration of diabetes and, 521, 521t
for IDDM, usage, 520, 520t
for NIDDM, usage, 520, 520t, 521t
therapy, hypoglycemia with, 289–290
use statistics, 10

Orientals, IDDM incidence in, age-adjusted, 40, 40t

Osaka, Japan, proteinuria studies, duration of NIDDM and, 357f

Osmotic diuresis, with hyperglycemia

mia, in elderly, 582

Osteomyelitis

of ankle or foot, 9
average annual frequency, in hospital discharge summaries, 490t
in diabetes, 410t, 490t, 491

Otitis externa, malignant

average annual frequency, in hospital discharge summaries, 490t
in diabetes, 490t, 495

Otitis media, malignant, in diabetes, 504

Out-of-pocket expenditures, for ambulatory medical care, 10

Outpatient services, frequency of use, in diabetic versus general population, 608t

Overweight

definition, 124
prevalence
in adolescents, by age and sex, 220a
in adults, by age, sex, and race, 220a
in general population, 124

P

Pacific Islander Americans

definition, 662
demographics, 662–663
diabetes in, 12–13, 661–681
ethnic categories, 662
ethnic distribution, 662t, 662–663
time trends in, 662–663, 663t
geographic distribution, 663, 664t
IDDM in, 663–664
NIDDM in, 12
lifestyle factors and, 12–13
undiagnosed, 12

Pacific Islanders. See also Asians

diabetes in, 674–676
reduction in physical activity and, 676
end-stage renal disease in, 360, 361t
mortality, from stroke, 449, 449t
percent screened for diabetes, 29t

Palatal ulcer(s), in diabetes, 504

Pancreas

α -cell function, in diabetic hemochromatotic subjects, 73
 β -cell failure
in NIDDM, 179, 180
NIDDM and, 200
 β -cell function
with chronic pancreatitis, 72

in hemochromatosis, 73

β -cell mass, secondary diabetes and, 69–70
diabetes and, 474–476
disorders, secondary diabetes with, 9, 70t
endocrine, tumors, secondary diabetes with, 76
exocrine, diabetes and, 475–476
exocrine function, with chronic pancreatitis, 72
malignancy, secondary diabetes with, 70t

Pancreatectomy, secondary diabetes with, 70t, 70–71

Pancreatic calculi, diabetes secondary to, 71

Pancreatic cancer

concurrent diabetes and, 462t–463t, 474
diabetes and, 457
diabetes as risk factor for, 474–475, 475f
in NIDDM, 9

Pancreatic cholera syndrome, secondary diabetes with, 70t

Pancreatic diabetes, 70t

Pancreatic transplantation, 533, 533t
for IDDM, 519, 533
effects on renal function, 533
nephropathy and, 533

Pancreatitis

alcohol consumption and, 525
diabetes and, 457, 476, 476t
secondary diabetes with, 70t, 71–72

Papillary necrosis, in diabetes, 7, 487, 489

Parental history of diabetes

diabetes status and, by sex, age, and race/ethnicity, 139a–140a
IDDM and, 117, 121–122, 122f, 139a, 140a
NIDDM and, 117, 121–122, 122f, 139a, 140a, 183, 215a–219a
community-based studies, 130
in nondiabetic population, 29f, 117, 122, 122f, 139a, 140a, 215a
in persons screened for diabetes, 29t

Parity

by age, sex, and diabetes status, 128f, 128–129, 156a–157a, 158a
in NIDDM, 118
NIDDM risk and, 194
of women screened for diabetes, 30t

Paronychia, in diabetes, 410t

Parotid gland, enlargement, in IDDM, 504

Patient education, 10

in diabetes, 519, 528t, 528–529, 529t, 530f
on foot care, 409

PDW. See Percent desirable weight

Pedal pulse, nonpalpable, stroke risk and, by diabetes status, 453

Pennsylvania, IDDM prevalence study, 39t

Pentamidine

diabetogenic effects, 69, 70t, 77t, 78
sites of action, 77t

Percent desirable weight

in nondiabetic population, 29f
in persons screened for diabetes, 29t
screening for undiagnosed NIDDM and, 31t, 31–32

Perinatal complications, in gestational diabetic pregnancies, 727

Perinatal morbidity, gestational diabetes and, 710–711

Perinatal mortality

in diabetic pregnancy, 724f, 724–725
gestational diabetes and, 710
in nondiabetic pregnancies, 724, 724f

Perinephric abscess, in diabetes, 487, 489

Periodontal disease

in diabetes, 501–504
incidence, 501
metabolic control and, 501–502
pathogenesis, 501, 503–504
prevalence, 501
by age group, 501, 502f
prevention, 504
severity, 501
treatment, 504
in IDDM, 9, 501–502, 502f
in NIDDM, 502–504
age and, 502f, 503, 503f
in North American Indians, 502f, 502–503, 504t, 691
bone loss in, 503, 503f

Peripheral neuropathy

in diabetic individuals, 691
lower extremity amputation risk and, 416, 417t
in North American Indians, 691

Peripheral vascular disease, 7. See also Lower extremity arterial disease (LEAD)

assessment, in diabetes, 401
diabetic, 401–408

- hospital discharge data for, 404t
 diabetic nephropathy and, 367
 in Hispanic Americans, 647, 648t
 hospital discharge data for, 404t
 lower extremity amputation risk and,
 in North American Indians, 691
 in NIDDM, at diagnosis, 17–18
- Peritoneal dialysis patients**
 cause-specific death rates for, by age,
 race, and diabetes status, 372,
 374t
 with ESRD attributed to diabetes,
 death rates for (1989–91), by
 cause of death, age, sex, and
 race, 397a
 not yet transplanted, death rates
 (1989–91) for, by age, race, and
 primary disease, 393a
- Phenformin, lactic acidosis with, 288**
- Phenothiazines, diabetogenic effects,
 70t**
- Phenoxybenzamine, insulin and glu-
 cagon responses to, with pheo-
 chromocytoma, 75**
- Phentolamine, insulin and glucagon
 responses to, with pheochromo-
 cytoma, 75**
- Phenytoin (Dilantin), diabetogenic ef-
 fects, 77**
- Pheochromocytoma, secondary diabe-
 tes with, 70t, 75**
- Philadelphia, PA, IDDM incidence in,
 racial and ethnic differences in,
 40**
- Philippines, diabetes prevalence in,
 674**
- Phobia(s), in adult diabetic popula-
 tion, 511t, 512**
 prevalence, 507
- Phosphoenol pyruvate carboxyki-
 nase, regulation, in NIDDM, 188**
- Phospholipase C gene**
 chromosomal location, 187t
 MODY and, 180
- Photocoagulation therapy, in diabetic
 retinopathy, 5–6**
 effects on diabetes-related visual loss,
 302, 303f
 focal, 293
 panretinal, 293
 prevalence, WESDR data, 330–331,
 331t
- Phycomycosis. See Mucormycosis**
- Physical activity**
 by age, sex, and race/ethnicity, 130,
 160a
 diabetic retinopathy and, 320
 NIDDM and, 191–193, 192t, 196, 620
 in Hispanic Americans, 641
 reduction in
 diabetes and, 676
 in Polynesia, 674–675
 NIDDM mortality and, 251
- Physical characteristics, of persons
 with diabetes**
 community-based studies, 119, 119f,
 130–132, 161a–163a
 national data sources, 117–130
 and community-based data, com-
 parison, 130–132, 161a–163a
- Physician(s), ambulatory care, ex-
 pected sources of payment for
 visits to, 598t, 598–599**
- Physician services**
 costs, 605
 individuals' out-of-pocket ex-
 penses, 608, 608t
 international comparison, 609
 in U.S., 604t
 frequency of use, in diabetic versus
 general population, 608, 608t
 health insurance coverage for, percent
 of diabetic persons with, 595
- Physician visits**
 disability and, 274, 274f
 of persons screened for diabetes, 30t
- Pima Indians**
 albuminuria in, 355, 356f
 blood pressure before diagnosis of
 diabetes and, 362–363, 363f
 duration of disease and, 355, 356f
 cataracts in, 692
 cerebrovascular disease mortality in,
 248
 coronary artery disease in, 692
 dextran clearance profiles, in diabet-
 ics versus nondiabetics, 353, 353f
 diabetes in
 incidence, 687
 prevalence, 684f, 685t
 diabetic end-stage renal disease in,
 690, 690f
 diabetic nephropathy in, familial clus-
 tering, 361
 diabetic retinopathy in, 320, 690, 691t
 gallbladder disease in, 691–692
 gallstone disease in, 473
 gestational diabetes in, 693
 implications for offspring, 711
 pregnancy outcome and, 710
 hypertension in, diabetic renal dis-
 ease and, 362–363, 363f
 impaired glucose tolerance in, diabe-
 tes development and, 19–20
 infants of diabetic mothers, diabetes
 in, 693, 693f
 insulin levels, genetic factors associ-
 ated with, 188
 insulin resistance in, as diabetes risk
 factor, 688–689
 insulin sensitivity in, genetic factors
 associated with, 189
 lower extremity amputation in, 691
 mortality in, by age, diabetes status,
 and proteinuria status, 358, 358f
 NIDDM in
 complications, 13
 determinants, 687–689
 diet and, 688–689
 end-stage renal disease with, 358,
 361
 family history of diabetes and, 183
 genetics, 687f, 687–688
 lifestyle and, 688
 mortality from, 689f, 689–690
 natural history, 13
 obesity and, 687f, 688, 688f
 pathogenesis, 688–689
 periodontal disease and, 9, 502f,
 502–503, 504t
 bone loss in, 9, 503, 503f
 prevalence, 13, 52–53
 proliferative retinopathy risk with,
 308
 proteinuria in, glycemic control
 and, 363, 364f
 risk factors for, 13
 obesity in
 energy metabolism in, 689
 NIDDM and, 687f, 688, 688f
 periodontal disease in, 691
 NIDDM and, 9, 502f, 502–503,
 503f, 504t
 plasma lipoproteins in, 692
 pregnancy in, preexisting diabetes
 and, 693
 proteinuria in
 duration of disease and, 357, 357f
 mortality risk and, 6
 stroke in, 692
 tuberculosis in, 691
- Pittsburgh, PA, Children's Hospital**
 IDDM disability data, 267, 267f, 272,
 272f, 273, 273f
 IDDM mortality studies, 223, 223f,

- 224–225, 225f, 228–229
- Pittsburgh Epidemiology of Diabetes Complications (EDC) Study**
autonomic neuropathy in, 346t, 347
disability data, 266t, 266–267, 267f, 268f, 270, 270f, 272–273, 273f, 274f, 274t, 274–275, 275f, 276t, 277, 277f
IDDM mortality data, 225, 226f, 228
neuropathy prevalence seen in, 346–347
- Pittsburgh IDDM Registry, 87. See also Allegheny County, PA**
disability data, 266t, 266–267, 267f, 272, 272f
- Place of residence, by population group, in U.S., 90–91, 91f, 105a, 106a**
- Plasma glucose. See also Fasting plasma glucose**
in diabetic persons, by race/ethnicity, 119, 119f
in Hispanic Americans, 647–648, 649a
in impaired glucose tolerance, 19
in NIDDM
in Hispanic Americans, 639t, 640
in Hispanic and non-Hispanic Americans, 659a
in persons without history of diabetes, by age, 119–120, 120f
by race, sex, and age, 119f, 119–120, 120f, 134a–135a
self-testing, 10
2-hour post-challenge
by diabetes status, 120, 121f
and sex and race, 120, 137a
in diagnosis, 18–19
in impaired glucose tolerance, 19
in NIDDM, 2–3, 18
in women, by race/ethnicity, in community-based studies, 119, 119f
in persons without history of diabetes, by age, 119–120, 120f
in undiagnosed NIDDM, 24, 24f, 25f
- Plasma prorenin activity, diabetic renal disease and, 363–364**
- Pneumonia**
in diabetes, 490t, 492, 504
mortality, 242t, 243f, 249, 492
viral, average annual frequency, in hospital discharge summaries, 490t
- POEMS syndrome, 76–77**
clinical features, 76
endocrine features, 76
secondary diabetes with, 70t
- Polycythemia, in offspring, in pregestational diabetic pregnancies, 727**
- Polyendocrine autoimmunity syndromes**
secondary diabetes with, 70t, 76
type I, characteristics, 76
type II
characteristics, 76
HLA association, 76
- Polyhydramnios, in pregestational diabetic pregnancies, 727**
- Polymorphonuclear leukocytes, defects, in diabetes, 485**
- Polynesia, diabetes in, 674–675**
- Polyuria, with hyperglycemia, in elderly, 582**
- Ponderal index, low, at birth, diabetes risk and, 194**
- Population statistics. See Demographic characteristics; Total population**
- Potassium depletion**
diabetes and, 77
glucose tolerance and insulin responsiveness in, 75
- Pracon Inc. study, cost estimates, 604–607**
disability and mortality productivity loss, 606
hospital service, 605
medication, laboratory, and other therapy/management costs, 606
nursing home service, 606
physician service, 605
short-term morbidity productivity loss, 606
- Prader-Willi syndrome, 70t, 80**
- Pregestational diabetes. See also Maternal diabetes; Pregnancy, preexisting diabetes and**
cesarean delivery and, 13, 729
diabetic nephropathy and, maternal risks with, 728–729
diabetic neuropathy and, maternal risks with, 729
diabetic retinopathy and, maternal risks with, 727–728
fetal complications, 719, 722–727
hypertension and, maternal risks with, 729
maternal hypoglycemia with, maternal risks with, 730
perinatal mortality and, 724f, 724–725
preterm delivery and, 729–730
prevalence, in pregnant women, 721–722, 722f
- Pregnancy. See also Gestational diabetes**
diabetes antedating, in North American Indians, 693
diabetes in, 525, 525t
prevalence, 720
diabetic nephropathy and, 13
diabetic renal disease and, 364–365
diabetic retinopathy and, 13, 321
glomerular filtration rate in, 364
NIDDM risk and, 194
outcome, gestational diabetes and, 710–711
preexisting diabetes and, 13, 719–733. *See also* Pregestational diabetes
cesarean delivery in, 13, 729
congenital malformations with, 13, 725t, 725–726
fetal complications, 719, 722–727
implications for offspring, 711, 722–727
macrosomia with, 13, 726–727
maternal mortality in, 727
maternal risks in, 13, 719, 727–730
perinatal mortality with, 13, 724f, 724–725
prevalence, 13, 719
spontaneous abortion with, 13, 722–724, 723f, 723t
preexisting IDDM and cesarean delivery with, 13, 729
implications for offspring, 727, 727t
preterm delivery with, 13, 729–730
as provocative test versus independent risk factor for diabetes, 704, 713
weight gain during, 525, 525t
- Preterm delivery, in pregestational diabetic pregnancy, 729–730**
- Prevalence, 1–2, 601**
in African Americans, 613, 616f, 616t, 616–618, 617t
increases in, 618
of diabetes, 47
community studies, 55, 56t–58t
of diagnosed diabetes, 17, 17t, 63a
by age and sex, 49, 49f, 49t, 50f, 50t
analysis of survey data, 48

- interpretation of survey data, 48–49
 racial differences in, 51*f*, 51–53, 52*f*, 52*t*, 63*a*, 65*a*, 66*a*
 racial distribution, 63*a*
 sex differences in, 50*f*, 51, 56*t*–58*t*
 time trends in, 49–51, 50*f*
- estimates
 with 1992 National Health Interview Survey, 604
 with 1987 National Medical Expenditure Survey, 604
- increases in, economic development and, 618
 national, determination methods, 47–53
 by race, 617*t*
 by race and sex, 1963–1990, 618*f*
 studies, methodological problems in, 430
- Preventive health services, for North American Indians, 693–694**
- Primary prevention, of NIDDM, in North American Indians, 694**
- Prince Edward Island, Canada, IDDM incidence in, temporal variation in, 44*f***
- Productivity losses**
 due to diabetes, 601
 evaluation, 602–603
 due to permanent disability and premature mortality, costs, 606–607
 due to short-term morbidity, costs, 606
- Progeroid syndromes, secondary diabetes with, 70*t***
- Progestational agents, diabetogenic effects, 70*t***
- Progestins, diabetogenic effects, 77**
- Proinsulin**
 gene, mutations, 79
 levels, in NIDDM, 197
 mutant (abnormal), 79
 characteristics of probands with, 79*t*
- Propranolol**
 diabetogenic effects, 77
 effects on progression of diabetic nephropathy, 369
- Prorenin. See Plasma prorenin activity**
- Protein(s)**
 animal, diabetes risk and, 676
 cow's milk, childhood IDDM and, 171
 dietary
 diabetes mellitus and, 524
 diabetic renal disease and, 365, 365*f*, 365*t*, 370–371, 371*f*, 371*t*
 IDDM incidence and, 170
 NIDDM and, 519
 restriction, renoprotective effects, 370–371, 371*f*, 371*t*
- Protein-deficient pancreatic diabetes (PDPD), 72**
 classification, 613
 diagnostic criteria for, 614*t*
- Proteinuria**
 charge selectivity, in diabetes, 353–354
 definition, 350
 in diabetic glomerulosclerosis, 350
 diabetic retinopathy and, 319–320
 dietary protein intake and, in diabetic patients, 365, 365*f*
 in Hispanic Americans, 650–654, 652*t*
 in IDDM, 6, 350
 duration of disease and, 356, 356*f*, 357*f*
 glycemic control and, 363, 363*f*
 incidence, 349
 prevalence, 354, 354*t*
 smoking and, 365–366, 366*t*
 time trends in, 349
 in NIDDM, 6, 24, 350, 354
 at diagnosis, 17–18
 duration of disease and, 356, 357, 357*f*
 prevalence, 354–355, 355*t*
 in nondiabetic population, 29*f*
 in persons screened for diabetes, 29*t*
 prevalence, in offspring, by sex and number of parents with proteinuria, 361, 362*f*
 risk, glycemic control and, 363, 363*f*
 as risk marker for NIDDM mortality, 252
 risk of visual loss and, 303
 selective glomerular permeability and, in diabetes, 353–354
- Pseudophakia, 323, 325*t***
- Psychiatric disorder(s), in adult diabetic population**
 gastrointestinal symptoms and, 513, 513*t*
 prevalence, 507, 508–512
- Psychoactive agents, diabetogenic effects, 70*t***
- Psychopharmacological therapy, in adult diabetic populations, 514, 515*t***
- Psychosocial aspects of diabetes, in adults, 9, 507–517**
- Psychosocial treatment(s), in adult diabetic populations, 514–515**
- Psychostimulants, side effects, in adult diabetic populations, 514, 515*t***
- Psychotherapy**
 in adult diabetic populations, 515
 in diabetes, 9
- Psychotropic medication(s), in diabetes, 9, 507**
- Puberty, diabetic retinopathy and, 313**
- Public assistance programs, coverage, for persons with diabetes, 11**
- Pueblo Indians, diabetes prevalence in, 685*t***
- Puerto Ricans. See also Hispanic Americans**
 blood pressure, by diabetes status, 146*a*
 body mass index
 by duration of NIDDM and age, 142*a*
 measured and self-reported, by age and sex, 144*a*
 by sex, diabetes status, and age, 141*a*
 diabetes prevalence in, 12, 631, 636, 636*f*, 636*t*
 fasting triglycerides, by diabetes status, 153*a*, 154*a*, 156*a*
 HDL cholesterol, by diabetes status, 154*a*, 155*a*
 hypertension in, by diabetes status and sex, 148*a*
 IDDM in, incidence, by sex, 43*t*
 LDL cholesterol, by diabetes status, 153*a*, 155*a*
 mean fasting triglycerides, by diabetes status, 151*a*
 mean HDL cholesterol, by diabetes status, 151*a*, 152*a*
 mean LDL cholesterol, by diabetes status, 150*a*, 152*a*
 mean total cholesterol, by diabetes status, 150*a*, 151*a*
 NIDDM in
 age-standardized prevalence, by percent desirable weight and age, 219*a*
 HHANES data, 635, 635*t*, 636*f*
 and hypertension, by age, 146*a*
 obesity in, by age and sex, 143*a*
 plasma glucose
 by age and sex, 135*a*

by diabetes status, 137a
subscapular-to-triceps skinfold ratio,
by sex and diabetes status, 145a
total cholesterol, by diabetes status,
153a, 154a, 155a
2-hour post-challenge plasma glucose
in, by age and sex, 136a

Pulse deficits

in diabetic versus nondiabetic popula-
tions, 402, 403t
in lower extremity arterial disease,
401, 404–405
lower extremity amputation risk
and, 417–418
in NIDDM, 7

Pulse pressure, NIDDM and, in His- panic Americans, 639t, 640

Pyelonephritis, 7

average annual frequency, in hospital
discharge summaries, 490t
in diabetic patients, 486, 488t, 489
emphysematous, in diabetes, 489
hospitalization for, in diabetes, 489,
490t

Pyriminil (Vacor)

diabetogenic effects, 69, 70t, 77t, 78
sites of action, 77t

Q

Quality of life, disability and, 276, 278

Quinalt Indians, diabetes prevalence in, 686t

R

Rabson-Mendenhall syndrome, second- ary diabetes with, 70t

Race/ethnicity

blood glucose testing and, 138a
diabetes prevalence and, by sex, 617,
617f
diabetes status and, with parental his-
tory of diabetes, by age, 139a–
140a
diabetic retinopathy and, 308–309,
309f
disability in diabetes and, 259
educational attainment and, diabetes
risk and, 194–195
exercise participation and, by diabe-
tes status, 160a
health insurance coverage and, 594t
health status and, by diabetes status,

160a
in hospital discharge data, 555
hypertension and, by age and diabe-
tes status, 149a
IDDM and
Colorado IDDM Registry data, 643–
644, 644f, 644t
mortality risk, 228
mortality and, diabetes as underlying
cause of death with, 247, 247f,
249, 249t
NIDDM and, 181f, 181–182, 182f
mortality risk, 249t, 249–251, 250f
plasma glucose and, by age and sex,
134a–135a
urine glucose testing and, 137a
urine ketone testing and, 138a
vision disorders and, 301

Racial admixture

NIDDM and, 183
in Hispanic Americans, 642f, 642t,
642–643
risk of childhood diabetes and, 615

Racial/ethnic distribution

of diabetic adults, 89, 89f
comparisons with 1979–81, 99
of diagnosed diabetes, 51f, 51–53,
52f, 52t, 56t–58t, 63a, 65a, 66a
of hypertension, by age, sex, and dia-
betes status, 124–127, 125f,
126f, 146a, 147a–148a
of impaired glucose tolerance, 55

Rad gene

mutation or overexpression (Ras-asso-
ciated diabetes), 78t, 80
overexpression, in NIDDM, 188

Rancho Bernardo, CA

age-adjusted prevalence of coronary
heart disease in, 432, 432t
community-based diabetes investiga-
tion, 119, 130–132, 161a
coronary heart disease data, 435, 436t
stroke risk data, age-adjusted, by sex
and diabetes status, 452, 452t
women with NIDDM

HDL cholesterol levels, 131, 164a
LDL cholesterol levels, 131, 164a
serum triglyceride levels, 131, 164a

Reflectance meters, in gestational dia- betes screening, 707–708

Refractory morbid obesity

appetite suppression for, in NIDDM,
524
gastric bypass for, in NIDDM, 524

Refugee Resettlement Program, 663

Renal disease. See Kidney disease

Renal hypertrophy, in diabetes, 352f, 352–353

Renal plasma flow, in diabetes, 351, 351f

Renal replacement therapy. See also Dialysis; Kidney transplant economic impact, 373

Respiratory distress syndrome, in off- spring, in pregestational diabetic pregnancies, 727

Respiratory infection(s). See also Bronchitis; Influenza; Pneumo- nia; Sinusitis in diabetes, 492–493

Retinopathy. See Diabetic retinopathy

Rhesus blood group

gene
chromosomal location, 187t
insulin resistance and, 188–189
in Hispanic Americans, NIDDM and,
643

Rhode Island, IDDM prevalence study, 39t

Rhode Island Hospital Study, dia- betic ketoacidosis in

incidence, 284, 284f
mortality, 286

Risk factors

in Asian and Pacific Islander popula-
tions, 676–677
for atherosclerosis, 196–197
for cataracts, 323, 324t
for cerebrovascular disease, 451
definition, 179
for development of diabetes, 3–4
for diabetes mortality, 233
for diabetes-related vision disor-
der(s), 301–303
for diabetic foot ulcers, 412–413, 413t
for diabetic nephropathy, 349
for diabetic renal disease, 361–366
for diabetic retinopathy, 308–321
in WESDR, 305
environmental, 689
for heart disease, in diabetic versus
nondiabetic persons, 438–444
for hypertension, 196–197
for IDDM. See Insulin-dependent dia-
betes mellitus (IDDM), risk fac-
tors for
for lower extremity arterial disease,
405
for NIDDM. See Non-insulin-depend-
ent diabetes mellitus (NIDDM),

risk factors for
in nondiabetic population, 29*f*
for obesity, 194

Rochester, MN

diabetic ketoacidosis in
incidence, 284, 284*f*
mortality, 286
diabetic residents, cerebrovascular disease mortality in, 248
IDDM incidence in
at age 20 years, 40*t*
by sex, 43*t*
temporal variation in, 44*f*
time trends in, 43*f*
IDDM prevalence study, 39*t*
lower extremity arterial disease in, incidence, 403–405, 405*t*

Rochester Diabetes Project, frequency distribution of neuropathy in, 340, 340*f*

Rochester Diabetic Neuropathy Project, 340–342

Rodenticides, diabetogenic effects, 70*t*

Rose questionnaire, for lower extremity arterial disease, 401–402

Rubin study, cost estimates, 608–609, 610

drugs and durable medical equipment, 609
emergency care, 609
hospital services, 609
physician services, 609

Rural residence

NIDDM risk and, 195
in persons screened for diabetes, 29*t*

RW pedigree, with MODY, 180

S

Salivary secretion, in diabetes, 504

Samoa. See American Samoa; Western Samoa

Samoans

diabetes in, 674–676
obesity in, 675–676

San Antonio, TX

age-adjusted prevalence of coronary heart disease in, 432*t*
community-based diabetes investigation, 119, 130, 162*a*
disability data from, health profiles, 278
NIDDM in
ethnic differences in, 182
incidence, 637, 638*f*, 638*t*

risk factors for, 638, 639*f*, 639*t*
women with NIDDM
HDL cholesterol levels, 131, 164*a*
LDL cholesterol levels, 131, 164*a*
serum triglyceride levels, 131, 164*a*

San Antonio Heart Study, 631, 632

NIDDM in
prevalence in Mexican Americans and non-Hispanic whites in, 633, 634*f*, 634*t*

risk factors for, 638, 639, 639*t*

San Diego, CA, IDDM incidence in, by sex, 43*t*

San Luis Valley, CO

age-adjusted prevalence of coronary heart disease in, 432*t*
community-based diabetes investigation, 119, 130–132, 162*a*, 342–343
insulin resistance syndrome in, genetics, 188–189

NIDDM in

ethnic differences in, 182

incidence, 198, 637, 638*t*

risk factors for, 639

women with NIDDM

HDL cholesterol levels, 131, 164*a*

LDL cholesterol levels, 131, 164*a*

serum triglyceride levels, 131, 164*a*

San Luis Valley Diabetes Study, 631, 632

prevalence of diabetes in Mexican Americans and Anglos in, 633, 634*t*

Sardinia, Italy, IDDM incidence in, 165, 166

Schmidt's syndrome, diabetes in, 76

Scotland, IDDM incidence in, temporal variation in, 44*f*

Screening

for diabetes
frequency, 21–23, 22*f*
methods, 21–23
NIDDM detection by, 15
rates, 15–16
in high-risk populations, 28–32
principles and rationale for, 23
for undiagnosed NIDDM, 2, 23–25, 25–27, 28*t*

Seattle, WA

community-based diabetes investigation, 119, 130–132, 161*a*
women with NIDDM
HDL cholesterol levels, 131, 164*a*
LDL cholesterol levels, 131, 164*a*

serum triglyceride levels, 131, 164*a*
Seattle Japanese-American Community Diabetes Study, 666–667, 676

Secondary diabetes, 1

with achondroplasia, 70*t*
with acromegaly, 70*t*, 74–75
with adenosine deaminase gene mutations, 78*t*, 180, 186*t*
with Alström syndrome, 70*t*
with ataxia-telangiectasia, 70*t*
with Bardet-Biedl syndrome, 70*t*
with carcinoid syndrome, 70*t*, 76
characteristics, 16*t*
with chromosomal defects, 70*t*
classification, 69, 70*t*
with Cockayne's syndrome, 70*t*
with Cushing's syndrome, 70*t*, 75
with cystic fibrosis, 70*t*, 71
definition, 2, 69
diagnosis, 16–17
with Down's syndrome, 70*t*
with dystrophia myotonica, 70*t*
with endocrinopathies, 70*t*, 74–77
with Friedreich's ataxia, 70*t*, 80
with genetic syndromes, 70*t*, 79–80
with glucagonoma, 70*t*, 76
with glucokinase gene mutations, 70*t*, 78*t*, 79–80, 185*t*, 185–187
with glycogen synthase gene mutations, 78*t*
with gut tumors, 76
with hemochromatosis, 70*t*
with hereditary relapsing pancreatitis, 70*t*
with Herrmann's syndrome, 70*t*
with Huntington's chorea, 70*t*
with hyperaldosteronism, 70*t*, 75
with hyperthyroidism, 70*t*, 75–76
with insulin gene mutations, 78*t*
with insulin receptor gene mutations, 78*t*, 79
with insulin receptor substrate-1 (IRS-1) gene mutations, 78*t*
with insulin resistance syndromes, 70*t*
with Kearns-Sayre syndrome, 70*t*
with Klinefelter's syndrome, 70*t*
with Laurence-Moon-Biedl syndrome, 70*t*, 80
with leprechaunism, 70*t*
with lipodystrophic syndromes, 70*t*
with Machado disease, 70*t*
metabolic outcome in, 69
with mitochondrial tRNA gene mutation, 70*t*, 78*t*

- with multiple endocrine neoplasia, 70t
- with muscular dystrophy, 70t
- with mutant (abnormal) insulin, 70t, 79
- with obesity-associated insulin resistance, 70t, 80
- with pancreatectomy, 70t, 70–71
- with pancreatic calculi, 71
- pancreatic β -cell mass and, 69–70
- with pancreatic cholera syndrome, 70t
- with pancreatitis, 70t, 71–72
- with pheochromocytoma, 70t, 75
- with POEMS syndrome, 70t
- with polyendocrine autoimmunity syndromes, 70t, 76
- prevalence, 2, 15, 17
- with progeroid syndromes, 70t
- with Rabson-Mendenhall syndrome, 70t
- with somatostatinoma, 70t, 76
- spectrum, 69
- with stiff-man syndrome, 70t, 80
- with Turner's syndrome, 70t
- with Werner's syndrome, 70t
- Second National Health and Nutrition Examination Survey (NHANES II), 521, 573**
- Seizures, hypoglycemia and, 290**
- Self-blood glucose monitoring, 528, 530–532, 531f, 532t**
 - patient characteristics in, 531
- Self-pay, expected percentage of total cost, decrease in, 550**
- Sensory neuropathy, in persons screened for diabetes, 29f**
- Septic arthritis, in diabetes, 410t**
- Sex**
 - alcohol consumption and, by diabetes status, age, and race/ethnicity, 159a
 - blood glucose testing and, 138a
 - diabetes prevalence and, by race, 617, 617f
 - diabetes status and, with parental history of diabetes, by age and race/ethnicity, 139a–140a
 - diabetic retinopathy and, 308
 - disability in diabetes and, 268, 268t, 269, 269f
 - exercise participation and, by diabetes status, 160a
 - fasting triglycerides and, by diabetes status, 154a, 156a
 - HDL cholesterol and, by diabetes status, 154a, 155a
 - health insurance coverage and, 594t
 - health status and, by diabetes status, 160a
 - heart disease risk and, 437t, 439, 439f
 - LDL cholesterol and, by diabetes status, 153a, 155a
 - mean fasting triglycerides and, by diabetes status, 151a
 - mean HDL cholesterol and, by diabetes status, 151a
 - mean total cholesterol and, by diabetes status, 150a
 - mortality and, diabetes as underlying cause of death with, 247, 247f, 250, 250f
 - NIDDM prevalence and, by obesity level and age, 220a
 - plasma glucose and, by age and race/ethnicity, 134a–135a
 - urine glucose testing and, 137a
 - urine ketone testing and, 138a
 - vision disorders and, 301
- Sex distribution**
 - of diabetic adults, 89, 89f
 - of hemochromatosis, 72
 - of hypertension, by age, race, and diabetes status, 124–127, 125f, 126f, 146a, 147a–148a
 - of IDDM, 85, 89
 - by age at diagnosis and race, 90, 90f
 - of IDDM incidence, 166, 166f
 - by age, 42, 42f, 42t, 43t
 - of IDDM mortality risk, 221, 228–230, 229, 230f
 - of neuropathy in diabetes, 343f, 343–344
 - of NIDDM, 85, 89, 89f, 182, 182f
 - by age and race, 88, 88f
 - by age at diagnosis and race, 90, 90f
 - of stroke incidence, racial differences in, 452, 452f, 453
 - of stroke risk
 - in Framingham Study, 453, 453f
 - in Japanese, by age and diabetes status, 452f, 453
 - in Rancho-Bernardo, CA, age-adjusted, by diabetes status, 452, 452t
- Sex hormone-binding globulin, decreased, NIDDM and, 197**
- Sex hormones, NIDDM and, 197**
- Sexual ateliotic dwarfism, diabetes mellitus and, 75**
- Sexual dysfunction, in diabetes, psychological factors affecting, 513**
- Shanghai, diabetes in, 68–72**
- Short Form Health Survey (SF-36), 277, 278**
- Shoshone Indians, diabetes in, prevalence, 685t**
- Sialorrhea, in diabetes, 504**
- Sialosis, in diabetes, 504**
- Sickness Impact Profile (SIP), 277**
- Singapore**
 - diabetes in, 669t, 670
 - ethnic distribution in, 668
- Sinusitis**
 - chronic, in diabetic patients, frequency, 487t
 - in diabetes, 492–493
- Sioux**
 - diabetes in
 - end-stage renal disease in, 690
 - prevalence, 685t, 686t
 - tuberculosis in, 691
- SIPP. See Survey of Income and Program Participation (SIPP)**
- Sjögren's syndrome, IDDM and, 504**
- Skin infection, in diabetes, 504**
- Skin lesions, in nursing home residents, 583**
- Sloan study, 665**
- Smoking. See Cigarette smoking**
- Social Security Administration (SSA)**
 - disability data from, 262, 265–266, 271, 271f
 - Survey of Work and Disability, disability data from, 262, 266, 266f
- Social Security Disability Insurance (SSDI), data on disability prevalence, 265–266**
- Sociocultural factors, NIDDM and, in Hispanic Americans, 640t, 640–641**
- Sociodemographic characteristics**
 - of North American Indians, 683
 - of persons with diabetes, 85–100, 102a–116a
 - comparisons with 1979–81, 99–100
 - of persons with NIDDM, 2
- Socioeconomic status**
 - of African Americans, 619–620
 - childhood IDDM and, 616
 - diabetes risk and, 194–195
 - of diabetic adults, 92–97, 107a–112a
 - diabetic retinopathy and, 320–321
 - IDDM incidence and, 173
 - NIDDM and, 619–620

- in Hispanic Americans, 640–641, 641t
- Sodium, hypertension and, 525**
- Sodium-lithium countertransport, essential hypertension and, 362**
- Somatostatinoma, secondary diabetes with, 70t, 76**
- Sorbitol, diarrhea caused by, 466–467**
- South Africa, diabetes in, 670**
- Southall, England, diabetes in, 670f, 671**
- Spain, IDDM incidence in, 165**
- Spinocerebellar ataxia. See Friedrich's ataxia**
- Spokane Indians, diabetes prevalence in, 686t**
- Spontaneous abortion(s), in diabetic pregnancy, 719, 722–724, 723f, 723t**
- Staphylococcus aureus**
bacteremia, in diabetes, 493
carriage, by diabetes status, 491t, 491–492
- Starch, glycemic effects, in diabetes mellitus, 524, 524t**
- Starr County Study, 631, 632**
Hispanic Americans in
diabetic retinopathy in, 650, 651f
hyperglycemia prevalence in, 631–632, 632t
with NIDDM, mortality data for, 645–646, 647t
- Steatosis**
in diabetes, 469–470
in obesity, 469
- Steno Memorial Hospital, Denmark**
IDDM mortality data, 225–226, 226f, 228–229
proteinuria studies, duration of IDDM and, 357f
- Stiff-man syndrome, secondary diabetes with, 70t, 80**
- Stillbirth, in diabetic pregnancy, 719**
- Stockholm Diabetes Intervention Study, 367–368**
- Stockings, for management of hypertension, 534**
- Streptozotocin, diabetogenic effects, 70t, 78**
- Stress**
glucose regulation and, 507, 512
IDDM and, 172
- Stroke**
costs, attribution to diabetes, 602
diabetes and, 449–456
in elderly, 581
hospital discharge data on, 561, 561f
epidemiology, 449
hospitalization for
in diabetic patients, 451, 451t
rate, 450
hyperglycemia and, 454
incidence
age and, 450, 452, 452f
improved diagnostic capabilities (ascertainment) and, 450
racial differences in, by sex, 452, 452f, 453
medical history, prevalence, 450t, 450–451
mortality, 449–450, 450f
by diabetes status, MRFIT data, 451, 451t
in NIDDM, 248–249
in North American Indians, 692
predictors, in Framingham Study, 453, 453f
prevalence, age and, 8
prevention, 454–455
prognosis, blood glucose levels as predictor, 454
risk
by age, 8
blood glucose level and, 454
by diabetes status, in Framingham Study, 453, 453f
in diabetic patients, 451–454
by race, 8, 449, 452, 452f, 452t
by sex, 8
in Framingham Study, 453, 453f
risk factors, 8, 449, 450
silent, improved diagnostic capabilities for, 450
vascular disease and, 450, 453, 453f
- Stroke belt, 449**
- Strong Heart Study, 130–132, 163a, 692**
- Subscapular-to-triceps skinfold ratio**
by age, sex, and diabetes status, 124, 124f, 145a
community-based studies, 130
in NIDDM
in Hispanic Americans, 639t, 640, 659a
in non-Hispanic Americans, 659a
- Substance use, in adult diabetic population, 511t**
- Sucrose, glycemic effects, in diabetes mellitus, 524, 524t**
- Suicide, mortality from, in IDDM, 227, 227f**
- Sulfonylureas, 519**
mechanism of action, 525–526
for NIDDM, 525–526
patient selection for, 526
therapy, hypoglycemia with, 289–290
- Surgeon services, health insurance coverage for, percent of diabetic persons with, 595**
- Survey of Income and Program Participation (SIPP), disability data from, 261–262, 265, 265f, 267, 268t**
- Survey of Work and Disability (Social Security Administration), disability data from, 262, 266, 266f**
- Sweden**
costs in, 609
IDDM in
in children, epidemiology, 168
incidence, temporal variation in, 44f
- Symptom reporting, psychological factors affecting, 507, 512–513**
- Syndrome X, 202**
pathogenesis, 197
dyslipidemia and, 197
in thrifty genotype hypothesis, 676
- Systolic Hypertension in the Elderly trial, 454**

T

- Taiwan, diabetes prevalence in, 672–673, 673t**
- Takatsuki syndrome. See POEMS syndrome**
- Task Force on Black and Minority Health, 613**
- TcPO₂. See Transcutaneous oxygen tension**
- Texas, Hispanics in, NIDDM prevalence in, 632t, 632–633, 633t**
- Thalassemia, abnormal glucose tolerance in, 73**
- Theophylline, diabetogenic effects, 70t**
- Therapeutic agents, diabetogenic effects, 77, 77t**
- Therapy for diabetes, 9–10, 519–540**
adjuvant, for complications of diabetes mellitus, 533–534
costs, 606

disability and, 270, 270*t*
 insulin. *See* Insulin therapy
 nutritional. *See* Nutritional therapy
 oral hypoglycemic. *See* Oral hypoglycemic agents

Thiazides
 diabetogenic effects, 70*t*, 77, 77*t*
 sites of action, 77*t*

Thiazolidinedione
 for diabetes mellitus, 533
 mechanism of action, 202
 in NIDDM prevention, 202

Three Area Study, 454

Thrifty gene/genotype hypothesis, 619, 676, 677

Thrombolytic Trials, data on reinfarction risk and death after acute MI, 436, 437*t*

Thyroid hormones
 diabetogenic effects, 74*t*
 sites of action, 74*t*

Toe systolic blood pressure index (TSPI), in lower extremity arterial disease, 402

Tohono O'odham Indians
 diabetes prevalence in, 685*t*
 gestational diabetes in, 709*t*
 pregnancy in, preexisting diabetes and, 693

Tongue, burning, in diabetes, 504

Tooth decay, in diabetes, 501

Toothlessness, in North American Indians
 prevalence, 9
 risk factors for, 503, 691

Torulopsis glabrata, urinary tract infection, in diabetes, 491

Total population, in U.S.
 distribution
 by age, 102a–103a
 by cohabitation status, 108a
 by employment status, 113a
 by family income, 111a
 by family size, 109a
 by marital status, 107a
 by size (in thousands) of urban population, 106a
 by type of employer, 115a
 by usual activity, 114a
 by years of education, 110a
 with military status (percent), 116a
 regional distribution, 105a
 urban/rural distribution, 106a

Toxins, diabetogenic effects, 70*t*

Transcutaneous oxygen tension. *See*

also Lower extremity arterial disease (LEAD)
 lower extremity amputation and, 417, 417*t*

Transient ischemic attacks, 450, 455

Trazodone, side effects, in adult diabetic populations, 514, 515*t*

Tricyclic drugs (tricyclic antidepressants)
 efficacy
 in adult diabetic populations, 514
 in diabetics, 507
 side effects, in adult diabetic populations, 514, 515*t*

Triglycerides
 elevated
 in NIDDM, 197
 in Hispanic and non-Hispanic Americans, 659a
 NIDDM mortality and, 251
 levels, with NIDDM, by race, 623, 624*f*
 mean fasting, in NIDDM, in Hispanic and non-Hispanic Americans, 659a
 NIDDM and, in Hispanic Americans, 639*t*, 640
 plasma/serum. *See also* Dyslipidemia abnormalities, by age, sex, race/ethnicity, and diabetes status, 128, 154a, 156a
 by age, sex, race/ethnicity, and diabetes status, 128, 128*f*, 151a, 153a
 community-based studies, 131, 161a, 162a, 163a, 164a
 diabetic renal disease and, 364
 in NIDDM, 3, 118
 in undiagnosed NIDDM, 24

Trinidad, diabetes in, 670–671

Trisomy 21. *See* Down's syndrome

t-RNA(Leu) gene, chromosomal location, 187*t*

Troglitazone
 for diabetes mellitus, 533
 in NIDDM prevention, 202

Tropical diabetes, 72

Tuberculosis
 average annual frequency, in hospital discharge summaries, 490*t*
 in diabetes, 490*t*, 493–494
 in North American Indians, 691
 prevention, 694
 prevalence, by diabetes status and sex, 488*t*

Turner's syndrome, secondary diabetes with, 70*t*

Twin studies
 of IDDM, 3, 170
 of NIDDM, 4, 183*t*, 183–184, 196

Type-1 protein phosphatase gene, chromosomal location, 187*t*

U

Ulcer(s). *See also* Foot ulcers; Leg ulcers; Palatal ulcer(s)
 definition, 428a
 gastrointestinal, self-reported physician-diagnosed, prevalence, by sex, age, and diabetes status, 460, 461*t*

Ulnar neuropathy, in diabetes, 342

Ultrasound, duplex, in lower extremity arterial disease, 402

Umatilla Indians, diabetes prevalence in, 686*t*

Unemployment. *See* Employment status

United Kingdom, IDDM incidence in, 40
 temporal variation in, 44*f*

United States
 dietary patterns in, 676, 676*f*
 IDDM incidence in, 37
 population
 1980–1990, by race and ethnicity, 663*f*
 by race, 1990, 662*t*
 by regions and race, 664*t*

United States Census, race definition in, changes in, 663

University Group Diabetes Program data
 on LEAD, 404–405
 on metabolic control and renal disease in NIDDM, 368–369, 369*t*
 on ocular complications, 298, 300*t*

Urban population size (in thousands), distribution of diabetes and, by population groups, in U.S., 85, 91, 91*f*, 106a

Urban/rural residence
 distribution of diabetes and, by population groups, in U.S., 91, 91*f*, 106a
 NIDDM risk and, 195
 in persons screened for diabetes, 29*t*

Urinary incontinence, with hyperglycemia, in elderly, 582

Urinary tract infection(s), in diabetes, 9, 375, 486, 504

candidal, 491
frequency, 487t
prevalence, by diabetes status and sex, 488t, 489

Urine glucose, in diabetic persons, 120–121, 121f, 137a

Urine glucose test(s)

in diagnosis, 21, 21f, 21t, 22t
frequency, 15
number performed annually, 2

Urine ketones, in diabetic persons, 121, 138a

U.S. Life Tables, in productivity-loss estimates, 603

Usual activity, distribution of diabetic adults by, in U.S., 97–98, 114a

Utah, IDDM prevalence study, 39t

Ute Indians, diabetes prevalence in, 685t

V

Vacor. See Pymiminil (Vacor)

Varicose ulcer, in diabetes, 410t

Vascular disease, stroke and, 450, 453, 453f

Vasoactive-intestinal polypeptide-producing tumor (VIPOMA, pancreatic cholera syndrome), glucose intolerance with, 76

Vasterbotten, Sweden, IDDM incidence in, temporal variation in, 44f

Very low density lipoprotein(s) diet and, in diabetes mellitus, 523 levels, glucose intolerance and, 197

Virgin Islands (U.S.), IDDM incidence in, 615

in black children under age 19, 43, 44f
by sex, 43t

Virus(es), IDDM and, 3, 166–167, 172

Vision disorder(s), diabetes-related, 5–6, 293–338. See also Blindness/legal blindness

age and, 301t, 301–302, 302f
causes, 297, 298f
duration of disease and, 301t, 301–302, 302f
hyperglycemia and, 293
in IDDM versus NIDDM, 296
incidence, 298–301

macular edema and, 302–303
prevalence, 294–296, 294–298, 296t
race and, 301
research needs related to, 305
risk factors for, 301–303
as risk marker for NIDDM mortality, 252
severity of retinopathy and, 302t, 302–303
sex and, 301
time trends in incidence, 300–301, 301t

Vision impairment

definition, 294
diabetes-related
rehabilitation for, 303–304
research needs related to, 305
resource materials for persons with, 337a

Vision test(s), frequency, by age and diabetes status, 328, 328t

Visual acuity, as predictor of death, 304f, 304–305

Visually impaired diabetic persons, resources for, 337a

Vulvovaginitis, *Candida*, in diabetes, 489–491, 490t

W

Waist-to-hip ratio

by age, sex, and diabetes status, community-based studies, 130
diabetes and, 671
in NIDDM, in Hispanic and non-Hispanic Americans, 659a

Warm Springs Indians, diabetes prevalence in, 686t

Weight gain

diabetes and, 677
insulin resistance and, 200

Weight reduction, in stroke prevention, 455

Werner's syndrome, secondary diabetes with, 70t

West, Kelly, 173

Westernization

NIDDM and, 664
weight gain and, 677

Western Samoa, diabetes prevalence in, 674–675

Whites, non-Hispanic

alcohol consumption, by diabetes status, age, and sex, 159a
blood glucose testing in, 138a

blood pressure, by diabetes status, 146a

body mass index

by duration of NIDDM, age, and sex, 142a
measured and self-reported, by age and sex, 144a
by sex, diabetes status, and age, 141a

diabetes in

in Coventry, England, 671, 671f
mortality from, 667, 667f, 668, 668f
prevalence, 51f, 51–52, 52f, 52t, 65a, 66a

sociodemographic characteristics, 85, 89, 89f, 90–91, 93, 95–97, 99, 102a–103a, 104a–106a

in Southall, England, 670f, 671
diabetes status, and parental history of diabetes, by age, 139a

diagnosed diabetes in

prevalence, 63a
three-year average number of, 1979–92, 66a

end-stage renal disease in, 360, 361t
exercise participation, by diabetes status, 160a

with family history of diabetes, by diabetes status and age, 216a, 217a, 218a

fasting triglycerides, by diabetes status, 153a, 154a, 156a

gestational diabetes in, 709, 709t

HDL cholesterol, by diabetes status, 154a, 155a

health status, by diabetes status, 160a

hypertension in
antihypertensive treatment for, 150a

by diabetes status and sex, 147a
measured and self-reported, by diabetes status, 148a

physician-diagnosed, by age and diabetes status, 149a

IDDM in

distribution, by age, 102a
end-stage renal disease in, 361, 361f
incidence, 1, 37, 40, 42f, 166, 664
age-adjusted, 40, 40t

risk, in relatives, 167t, 167–168
insulin levels, genetic factors associated with, 188

LDL cholesterol, by diabetes status, 153a, 155a

mean fasting triglycerides, by diabe-

tes status, 151a
 mean HDL cholesterol in, by diabetes status, 151a, 152a
 mean LDL cholesterol in, by diabetes status, 150a, 152a
 mean total cholesterol, by diabetes status, 150a, 151a
 mortality in, diabetes as underlying cause of death for, 247, 247f, 249, 249t, 250, 250f
 NIDDM in
 end-stage renal disease in, 361, 361f
 family history of diabetes and, 183
 and hypertension, by age, 146a
 incidence, 54
 metabolic characteristics, national and community-based studies, comparison, 130–132, 161a
 retinopathy risk in, 308, 309, 309f
 women
 HDL cholesterol levels, 131, 164a
 LDL cholesterol levels, 131, 164a
 serum triglyceride levels, 131, 164a
 NIDDM prevalence in
 age-standardized, by percent desirable weight and age, 219a
 by family history of diabetes and age, 219a
 and in Hispanic Americans, comparison, 637, 637t
 obesity in, in NIDDM, by age and sex, 143a
 overweight in, by age and sex, 220a
 parity, by diabetes status, age, and sex, 156a–157a, 158a
 percent screened for diabetes, 29t
 plasma glucose in
 by age and sex, 134a
 by diabetes status, 137a
 smoking and, by diabetes status, age, and sex, 158a
 stroke in
 carotid artery intimal-medial wall thickness and, 453f, 454
 mortality from, 449, 449t, 450f
 risk, 452, 452f, 453f, 454

subscapular-to-triceps skinfold ratio, by age, sex, and diabetes status, 145a
 total cholesterol, by diabetes status, 153a, 154a, 155a
 2-hour post-challenge plasma glucose in, by age and sex, 135a–136a
 undiagnosed NIDDM in, 23t
 urine glucose testing in, 137a
 urine ketone testing in, 138a
Widowed persons. See Marital status
Wielkopolska, Poland, IDDM incidence in, temporal variation in, 44f
Willingness-to-pay method, 602–603
Winnebago Indians, diabetes prevalence in, 686t
Wisconsin
 coronary heart disease data, 435, 436t
 IDDM incidence in, by sex, 43t
Wisconsin Epidemiologic Study of Diabetic Retinopathy (WESDR)
 cataract data, 321, 322, 323, 323t, 324t, 325t
 diabetic retinopathy data, 305, 306t, 307t, 307–310, 308t, 310t, 311t, 314, 314t, 315t–316t, 317t, 317–321, 318t, 319t, 321f, 338a
 epidemiologic findings, 5
 foot ulcer data, 412, 413
 glaucoma data, 326, 326f
 IDDM mortality data, 224, 225–226, 226f, 228
 ophthalmic care data, 328–329, 330t
 photocoagulation data, 330–331, 331t
 visual impairment data, 296f, 296–297, 297f, 298–299, 300, 300t, 301t, 302–303, 304
Wolfram's syndrome, 80
Women. See Female(s)
Wood, Philip, 260
Worcester Heart Attack Study, data on reinfarction risk and death after acute MI, 436, 437t
Work disability
 in diabetes, 265
 Social Security Disability Insurance

(SSDI) data on, 265–266
 Survey of Work and Disability data on, 266, 266f
 time trends in, 271, 271f
 in IDDM, 267, 267t
 late complications of diabetes and, 270, 270f

World Health Organization (WHO)
 diagnostic criteria for diabetes, 17–18, 18t, 50–51
 versus NDDG criteria, 18–19
 diagnostic criteria for impaired glucose tolerance, 19, 20t
 Multinational Project for Childhood Diabetes (*DIABete Mondiale*, *DIA-MOND* Project), 38, 38f, 165
Wound infection, surgical, in diabetes, 495, 495t

X

45,XO. See Turner's syndrome
47,XXY. See Klinefelter's syndrome

Y

Yakima Indians, diabetes prevalence in, 686t
Yupik Eskimo, gestational diabetes in, 693, 709t

Z

Zinc, dietary, for venous stasis ulcer, 525
Zuni
 diabetic end-stage renal disease in, 690
 gestational diabetes in, 693, 709t
 NIDDM in
 lifestyle and, 688
 prevalence, 685t
 pregnancy in, preexisting diabetes and, 693
Zygomycosis. See Mucormycosis