

## Index

---

- Abortion (*see* fetal death) 15, 105, 172
- Acclimatization (*see also* adaptability) 26–27
- Activity patterns (*see also* workloads)  
 during pregnancy 4–6, 76, 77, 89, 150, 198–199  
 during pregnancy, questions about 76–77  
 effect on birthweight 91–96, 99–100, 150, 161–164, 180–182, 192, 198  
 seasonal variation in 5, 38, 49, 91–92, 94–95, 129, 140, 181–182, 202
- Adaptability (*see also* adaptation) 7–8, 10  
 history of studies 7–8, 26–27  
 intrapopulation variation in 3, 4, 30–31, 105–106, 185–186  
 modes of 13–14  
 relationship to biocultural approaches 7–8
- Adaptation (*see also* natural selection; evolutionary theory) 10, 13–15, 192–193  
 and culture 13–14  
 and population history 4, 11, 25–26, 150–151, 185–186  
 as compromise 14, 19–21, 34, 186–189  
 biocultural 7–8, 9, 192–193  
 birthweight as a measure of 15, 27, 33–34, 105–106, 150–151, 160–161, 178, 185–186  
 genetic, among high-altitude populations 25–27, 185–186, 206  
 health and 7–8, 15  
 measures of 14–15, 185  
 relevance for health policy 23–24, 178–179, 196–197
- Age (*see* maternal characteristics; gestational age)  
 pattern of infant mortality, in Ladakh 6, 116–119, 151, 153–154, 182, 183–184  
 pattern of pediatric hospital admissions 122–123, 134–135, 183
- Agriculture  
 competes with reproduction 6, 186–189  
 decline of, in Ladakh 41–43, 190–192, 201–203  
 house gardens in Ladakh 49, 53, 188  
 production of food 4, 48, 49–50, 79, 181, 184  
 seasonality of, in Ladakh 5, 38, 49, 91–92, 94–95, 129, 140, 181–182, 202  
 subsistence in Ladakh 4, 42, 49–50, 79  
 women's contributions to 5, 50, 52–53, 76–77, 95, 186–187
- Allostasis 11
- Altitude (*see* high altitude)
- Amchi* (*see also* Tibetan medicine) 58–69, 102–103, 141–142, 207

## 228 Index

*Amchi (cont.)*

usage of, during pregnancy  
100–101, 199

usage of, for infants 141–142

Anemia (*see also* hemoglobin;  
malnutrition) 61, 160

among infants 138

among north Indian women 169,  
176

during pregnancy in Ladakh 82,  
90–91, 94, 169, 200

effect on birthweight 90

Andes 3, 15–17

antiquity of habitation 25, 150–151

biocultural studies in 15–16

birthweight in 28–29, 32–33,  
147–151

birthweight, compared to Ladakh  
147–148, 151, 185

breastfeeding patterns in 154–155

child care patterns in, 154

child growth and development in  
15, 30–32, 150

infant/neonatal mortality in 34,  
151–156

maternal characteristics in 148,  
149–150

reproductive problems in, among  
Spanish 3, 35

Anthropometry (*see also* neonates;  
maternal anthropometry;  
methods) 73–75, 82–83,  
108

APGAR score 71

Aridity 37, 41, 135

Asphyxia 161, 173

Attachment 130–131, 133, 189

childcare patterns and 132,  
189

of Ladakhi infants and mothers  
131–133, 189

Autonomy

in relation to attachment 131–133,  
189

individual, and household  
membership 51, 61, 132,  
188–189, 190, 206

Baker, P. T. 17, 26, 34

Barley (*tsampa*) 4, 31, 49, 56, 90, 129,  
137, 155, 163, 190

Beall, C. M. 4, 25–26, 27, 151–156

Bias (*see also* sample characteristics)

gender, in childcare 133–134,

142–144, 164, 165, 184

in anthropological fieldwork 62–64

in birth outcome analyses

108–109, 117

in sample 63, 77–81

Bilirubin (*see* jaundice) 71, 110, 133

Biocultural perspectives (*see also*  
adaptability, adaptation) 7–8, 9,  
192–193

as one story about reproductive  
health in Ladakh 24

biocultural ethnography 17, 21–23,  
62–63

body in 9–11

culture in 8–10, 13–14

on health 6–7, 15, 57–58

on health in the Andes 15–16

on reproductive health in Ladakh  
5–6, 16–19, 63–64, 186–189,  
192–203

population in 8–11

Biomedicine (allopathy) 1, 6

facilities in Ladakh 58–60, 100

interventions to improve birth  
outcome 140–141, 197,  
198–201

Leh hospital 52, 58–59, 101, 140,  
171, 198

resources for infant health 140,  
141

usage during pregnancy 1, 68, 100,  
103, 170–175, 181

Birth (*see* childbirth; fertility)

age at first 100, 169, 170

seasonality of, in Ladakh 116–120,  
121

Birth control 109, 144, 165, 170, 193,  
202, 203, 208

Birth order (*see also* parity)

and infant mortality 115–118, 142,  
164–169

- effect on birthweight 87–88, 93, 117–118, 157
- Birth outcome (*see* birthweight, neonatal mortality, infant mortality)
- Birth records (*see also* reproductive histories)  
from Leh hospital 69, 115–116, 206
- Birthweight 71, 72–74  
among Sherpas in Nepal 30, 92, 147–157, 159–160  
and socioeconomic status 1, 19, 72, 106–108, 150–154, 181–201  
and socioeconomic status, in Ladakh 18, 95–96, 97–98, 115, 150, 156, 180–181, 186  
as a measure of adaptation 15, 27, 33–34, 105–106, 150–151, 160–161, 178, 185–186  
as a predictor of infant mortality in Ladakh 6, 111–115, 151–154, 179, 186  
as a predictor of infant mortality, in general 17, 27, 32, 72, 105, 107, 171–173  
as link between maternal and infant resources 17, 72, 106, 107  
at high altitude 4, 27–30, 146–147  
blood pressure in pregnancy, effect on 91
- Buddhist-Muslim differences  
in Ladakh 98–100, 115, 181–192
- comparison of Ladakhis and migrants in the Andes 147–149, 150–151, 185
- comparison of Ladakhi and Han Chinese in Tibet 157, 161
- comparison of Ladakhi and North Indians 167–173, 174
- comparison of Ladakhi and Sherpa 147–158, 166
- comparison of Ladakhi and Tibetan 157–166, 185
- comparison of Ladakhis and Tibetans in Ladakh 96–98, 157–159, 181–185
- determinants of, in general 6, 71–73, 86–87, 107
- determinants of, in Ladakh 86–100, 101, 149–151, 179–182, 197–200
- diet during pregnancy and effect on 76, 88–91, 150, 157, 180–182, 198–199
- distribution, in Ladakh sample 83, 84
- effect of hypoxia on 4, 27–30, 32, 73, 105–106, 124, 174, 175, 182, 185–186
- ethnic differences, in Ladakh 84, 85–96, 115, 181
- gestational age, effect on 73, 87, 92, 180
- in Ladakh sample 5–6, 82, 83–85, 111, 146, 182
- in relation to disease vulnerability 34, 111, 121, 155, 175
- in the Andes 28–29, 32–33, 147–151
- in Tibet 29–30, 147–157
- interventions to increase, in Ladakh 197–200
- link to infant mortality modified at high altitude 4, 32–34, 111, 151–153
- low (*see* low birthweight)
- maternal education, effect on 96, 115, 192
- maternal weight as a predictor of 86–95, 198
- maternal workloads, as a predictor of 91–96, 99–100, 150, 161–164, 180–182, 192–198
- nutrient supplementation, effect on 88, 198
- of migrants in Ladakh 97, 98, 185
- of migrants to high altitude 4, 29, 98, 146–149
- parity, effect on 87–88, 93, 117–118, 157

Cambridge University Press

0521830001 - An Ecology of High-Altitude Infancy: A Biocultural Perspective

Andrea S. Wiley

Index

[More information](#)

## 230 Index

Birthweight (*cont.*)

- pregnancy-induced hypertension, effect on 28, 91, 182, 198
- prenatal care, effect on 101, 181, 200
- seasonality in 94–95, 120, 181–182
- sex differences in, at high altitude 29, 149, 157
- sex differences in, in general 29, 73–83, 84–85, 148
- sex differences in, in Ladakh 84, 85, 149, 157, 180
- smoking, effect on 73–99, 150–157

## BCG and polio vaccination 125

- Blood pressure (*see also* hypertension, pregnancy-induced hypertension) 15, 76
- during pregnancy in Ladakh, effect on birthweight 91

## Body

- as product of evolutionary history 10–11
- in biocultural approaches 9–11

## Bon religion 45–46

## Bowlby, J. 130–131, 133, 189

## Breastfeeding 128

- among Andean populations 154–155
- among Tibetans 163–164
- frequency of, in Ladakh 129, 137–138, 154
- in North India 173–174, 176
- in relation to women's work 129–137, 155–163, 183, 198
- of Ladakhi infants 129, 137–138, 154–155, 176, 183
- termination of 139

## Buddhism 2, 47, 131

- and women's status 5, 52
- in Ladakh 43–45, 51–52, 131

## Buddhist–Muslim conflict in Ladakh

47–49, 57, 79, 90, 98, 181, 190

## Calories, in Ladakhi diet 5, 18, 60–61

## Capillarization

- as an adaptation to hypoxia 26

Carbon monoxide (CO; *see also* smoking, pollution) 18, 99, 126, 136, 191

Cardiovascular system, at high altitude 26, 30

Census of India 77–78, 80, 206

Cesarean section 1

Chang-Tang plateau 43

Chen, L. C. 17–19, 106–107, 179

Chest circumference (*see also* lung volume) 74, 97, 111–112

as a predictor of infant mortality 114

of Ladakhi neonates 74, 97, 111–112

## Childbirth

in Ladakh 53–66, 78–79, 81, 131, 175

in Leh hospital 63–66, 69, 81, 118–132, 175, 199

in North India 173

## Childcare 2–6, 129–130, 133

and attachment, in Ladakh 132, 189

fluidity of 53–55, 132, 139–140, 184, 189

gender biases in 133–134,

142–144, 164, 165, 184

health care usage for infants 133, 134–140, 174

in Himalayan populations 134, 143, 163–165

Child health (*see also* growth and development)

and infectious disease, in Ladakh 136, 137

at high altitude 15, 30–32, 150

in Ladakh 136, 137, 150, 159

## Child mortality 116, 163

deaths in Leh hospital 67, 116–118

in Himalayan populations 116, 163

in Ladakh 5, 118, 135

in Leh hospital 67, 116–118

proximate determinants of 19, 20, 106–108, 178–179

## Childhood, anthropology of 17

- Children's work 55, 143, 144, 165, 192, 207
- Christians 43
- Cold (*see also* hypothermia) 3, 12, 30, 37, 135, 154, 155–156  
 concern about, in Ladakh 75, 125, 164, 183  
 seasonality of, in Ladakh 2–4, 40–41, 126, 127–135, 183–189
- Colorado Rockies  
 antiquity of habitation 25  
 birthweight in (*see also* PIH) 29, 33, 198
- Contraception 109, 144, 165, 170, 193, 202, 203, 208
- Cox regression (hazard analysis) 109–110, 112–115, 208
- Cultural ecology  
 in Ladakh research 18, 39–40, 184–185, 186
- Culture  
 and adaptation 13–14  
 and reproduction 2  
 and reproductive health 6  
 in biocultural analyses 8–10, 13–14
- Dairy products  
 consumption by infants (*see also* supplementation) 129, 137, 155, 163, 183, 198  
 consumption during pregnancy 5, 76, 94  
 in Ladakhi diet 4, 49, 60
- Darwin, C. 10
- Death (*see also* neonatal, infant, child, maternal mortality)  
 emotional response to 131–132
- Diarrheal disease (*see* gastrointestinal infection)
- Diet  
 and household resources 5, 168–169, 187–188  
 at high altitude 31  
 calories in, in Ladakhi 5, 18, 60–61  
 change during pregnancy, cultural beliefs about 2, 73, 159–160, 168–169  
 during pregnancy, variation by parity 94  
 in Ladakh 55–57, 60–61  
 in pregnancy, beliefs about in Ladakh 5, 89–90, 181, 187–188  
 in pregnancy, effect on birthweight 76, 88–91, 150, 157, 180–182, 198–199  
 in pregnancy, questions about 76–77  
 of infants (*see* breastfeeding, supplementation)  
 protein in, in Ladakhi 5, 60  
 recent changes in 190–191  
 seasonal variation in 4, 31–38, 55–56, 64, 89, 94–95, 138, 181–182  
 supplementation in pregnancy, effect on birthweight 88, 198
- Disease  
 definition of, in medical anthropology 11
- Dogra invasion 46
- Domestic pollution (*see also* pollution; carbon monoxide) 18, 99, 126–127, 182–200  
 and respiratory disease 99, 126–127, 135, 156, 183–189  
 compromising infant health 99, 126–127, 135, 156, 183–189
- Dowry 51, 134, 165–166, 167
- Ecology of infancy 17, 19  
 in Ladakh 2, 39–41
- Education  
 as a determinant of birth outcome 96, 115, 192  
 of women and their husbands in sample 76–80, 82
- EGA (*see* gestational age) 71, 76–83, 114, 149

## 232 Index

- Eggs  
 consumption during pregnancy 76–88, 89
- Emotions (*see also* attachment)  
 in marriage 51  
 in relation to childbearing 6, 57, 67, 131–132
- Employment  
 and household absenteeism 52–53, 95–96, 163, 181, 190  
 men's 52, 53, 79–80, 95–96, 190  
 nonagricultural 52–53, 79–80, 95–96, 157, 181–190, 192–201, 208  
 women's 46–47, 52, 80, 190
- Environment (*see also* high altitude; Ladakh)  
 definition of, in biocultural analyses 12–13  
 relation to health 7, 12–13  
 social (*see* socioecology, stratification, poverty)
- Ethnicity  
 in relation to birth outcome in Ladakh 84, 85–96, 115, 181  
 of women in the sample 76–77, 79
- Ethnographic human biology 19–21, 24
- Evil eye (*mik-ya*) 101–103, 108, 125
- Evolutionary theory 7–10, 182  
 and biocultural approaches 7–8, 9, 192–193
- Family (*see also* household, marriage)  
 rise of nuclear, in Ladakh 190
- Family planning 109, 144, 165, 170, 193, 202, 203, 208
- Farmer, P. 23, 193–194, 195
- Fat deposition (*see also* skinfolds)  
 fetal, at high altitude 28, 85
- Fertility 15–17, 105  
 at high altitude 35–37, 38  
 in Ladakh (*see also* contraception) 5–6, 37, 186, 202–203
- Fetal death 15, 105, 172  
 at high altitude 32–35, 36–37, 149, 152, 161  
 in Ladakh 37, 67, 82, 115–116, 118, 199
- Fetal growth (*see also* birthweight; Ponderal Index; neonates) 32, 72, 85, 86  
 affected by work during pregnancy 91–96, 99–100, 150, 161–164, 180–182, 192–198  
 affected by diet during pregnancy 76, 88–91, 150, 157, 180–182, 198–199  
 at high altitude 4, 27–30, 37, 91, 149  
 in Ladakh 86–92, 114, 149, 154, 174, 182–187
- Fever 14, 154
- Fieldwork  
 anxiety about 69–70  
 in Ladakh 21, 61–63, 70  
 reflexivity about, in human biology 21, 61–62
- Fitness (*see* reproductive success) 4–13, 27, 105
- Food taboos  
 for pregnant women 5, 89–90, 181, 187–188
- Formula feeding (*see also* supplementation; breastfeeding) 128, 129  
 among Ladakhi infants 129
- Gastrointestinal infection  
 as a cause of infant morbidity 121–124, 135–137, 163, 183–201  
 as a cause of infant mortality 35, 119, 135–137, 155, 161–163, 183–201  
 at high altitude 31–32, 35, 60, 155  
 gender differences in 119, 122–123, 176, 184, 189  
 seasonality of 126, 155, 183, 184
- Gender  
 and bias in childcare 133–134, 142–144, 164, 165, 184  
 bias in health, in North India 133–134, 166–167, 168

- desire for sons or daughters  
   142–143, 144, 165  
 differences in health, in Ladakh 5,  
   122–123, 138–139  
 differences in infant morbidity  
   122–123, 134  
 differences in infant mortality 34,  
   111–112, 114–115, 161–174  
 differences in infanticide 53, 154  
 Gene flow 10–11, 26  
 Gene pool 1, 8, 49  
 Genetic  
   adaptation to high altitude 25–27,  
     185–186, 206  
   drift 10–11, 26  
 Gestational age 71, 76, 83, 114, 149  
   as a predictor of birthweight 73,  
     86, 92, 180  
   by last menstrual period 76, 83  
   effect on infant mortality 33,  
     111–114, 182  
 Goiter (*see also* iodine) 16, 61  
 Goldstein, M. C. 37, 51, 53, 134,  
   165, 186  
 Growth and development 10–15, 32,  
   187  
   in relation to socioeconomic status  
     15, 30–31, 150, 156, 207  
   in the Andes 15, 30–32, 150  
   in the Himalaya 157, 163  
   of Ladakhi children 136, 137, 150,  
     159  
*Gur-gur cha* 53–56, 90–91, 137  
 Haas, J. D. 4, 28, 83–85, 90, 114,  
   147–149, 150  
 Han Chinese  
   birth outcome of, in Tibet 4, 29,  
     157  
   birthweight, compared with  
     Ladakhis 157, 161  
 Hazard analysis (Cox regression)  
   109–110, 112–115, 208  
 Head circumference 71, 74, 111–112,  
   149  
 Health  
   as a measure of adaptation 7–8, 15  
   as a relative state 11–12  
   biological indices of 7  
   definitions of 11–12  
   in Ladakh 5, 60–61  
   policy, and biocultural analysis  
     23–24, 178–179, 196–197  
   problems, encountered by  
     pregnant women in Ladakh 77,  
       100, 178, 203  
 Health care (*see also* biomedicine,  
   Tibetan medicine) 57–60  
   seasonality in biomedical care  
     usage 120, 140  
   usage, during pregnancy 100–104  
   usage, for infants 133, 134–140,  
     174  
 Health interventions  
   medical anthropological  
     perspectives on 193–195,  
       196–197  
   to decrease neonatal and infant  
     mortality in Ladakh 23–24,  
       193–203  
   to improve reproductive health in  
     Ladakh 23–24, 193–203  
   to increase birthweight in Ladakh  
     197–200  
   to reduce negative effect of hypoxia  
     on birth outcome 140–141,  
       197, 198–201  
 Health policy (*see also* health  
   interventions)  
   and adaptation 23–24, 178–179,  
     196–197  
   different perspectives on high  
     neonatal mortality in Ladakh  
     193–195, 201–202  
 Height  
   of Ladakhi children 136, 137, 150,  
     159  
   of mothers in sample 73–82, 83,  
     84–159  
 Hemoglobin (*see also* anemia) 12–15,  
   26, 27, 76, 169  
   effect on birthweight 90  
   of mothers in sample 83, 90, 157,  
     159

## 234 Index

High altitude (*see also* hypoxia)

- adaptation to 26–27, 105
  - average birthweight at 4, 27–30, 146–147
  - cardiovascular system 26, 30
  - child health at 15, 30–32, 150
  - definition of 25
  - diet at 31
  - ecological conditions at 3, 25
  - fertility at 35–37, 38
  - fetal death at 32–35, 36–37, 149, 152, 161
  - fetal growth at 4, 27–30, 37, 91, 149
  - gastrointestinal infections, prevalence at 31–32, 35, 60, 155
  - history of habitation at 25–26, 150–151, 160–161, 185–186
  - hypoxia at 3, 25
  - infant mortality rates at 32–35, 152, 161, 166
  - infectious disease patterns at 25, 31, 32, 137, 155, 163–176
  - menstruation at 3, 36
  - ovulatory function at 36, 37
  - oxygen saturation among infants, at 35, 126, 127, 197
  - oxygen saturation at 27
  - population genetic characteristics at 25–26, 185–186
  - populations living at 17, 25–26
  - pregnancy-induced hypertension, at 28, 91, 182
  - reproduction at 3–4, 27, 35–37
  - respiratory infection at 31–32, 35, 135
- Himalaya 2, 17–21, 51–62
- child growth and development in 157, 163
  - childcare patterns in 134, 143, 163–165
  - infant mortality in 161–166
  - populations living in 2, 18, 156–166
- Hookworm 31, 169, 176

## Hospital

- age pattern of pediatric admissions 122–123, 134–135, 183
- birth records 69, 115–116, 206
- causes of infant mortality at 119–121
- in Leh 52, 58–59, 101, 140, 171, 198
- neonatal admission diagnoses 122, 123
- pediatric admissions, causes of 124–138
- pediatric records 69, 116
- usage of, for birth 63–66, 69, 81, 118, 132, 175, 199

## Household

- absenteeism, due to employment 52–53, 95–96, 163, 181, 190
- and production of health 18–19, 21, 50, 106, 125
- as adaptive locus 15, 16
- as developmental niche 18, 125, 184
- as locus of production and reproduction 19, 185, 186–189
- distribution of resources within 18–19
- dynamics 50–53, 125, 190
- gardens 49, 53, 188
- membership, and individual autonomy 51, 61, 132, 188–189, 190, 206
- resources, and diet 5, 168–169, 187–188
- structure 50, 52, 76, 190, 207

## Human biology 17

ethnographic 19–21, 24

Huss-Ashmore, R. 12–14, 16

## Hypertension

- during pregnancy 28, 91, 198–200
- during pregnancy, at high altitude 28, 91, 182
- during pregnancy, effect on birthweight 28, 91, 182, 198
- in Ladakh 191
- related to salt consumption 61, 91



- Hypothermia (*see also* cold) 120–126, 127, 161–164, 183
- Hypoxemia (*see also* oxygen saturation) 35, 126, 127, 197
- Hypoxia (*see also* high altitude) 3–4, 41, 106, 189, 193  
 adaptation to 26–27, 105  
 and physical work 4–5, 6, 94, 182  
 at high altitude 3, 25  
 effect on birthweight 4, 27–30, 32, 73, 105–106, 124, 174, 175, 182, 185–186  
 effect on human biology 3, 4–5, 25, 26–27  
 effect on reproduction 3–4, 27, 35–37  
 genetic adaptations to 25–27, 185–186, 206  
 interaction with respiratory disease 34–35, 124–176, 183  
 interventions to reduce effect on birthweight and neonatal mortality 140–141, 197, 198–201  
 population variation in response to 27, 105–106, 146–147, 150–151  
 social factors influence variation in response to 3, 4, 30–31, 105–106, 185–186  
 ventilation as an adaptation to 26, 27–29
- Illegitimate births 132–133, 143, 164
- Illness  
 definition of, in medical anthropology 11
- India  
 birthweight in, compared to Ladakh 167–173, 174  
 census of 77–78, 80, 206  
 conflict with China 46, 205  
 conflict with Pakistan 46, 63–202, 205  
 gender bias in health 133–134, 166–167, 168  
 government investment in Ladakh 21, 46–47, 190–202  
 infant mortality, compared to Ladakh 169–170, 171–177, 195–196  
 Ladakh, integration into 18, 49, 166, 176–177, 189–190, 191–192  
 map of 40  
 maternal characteristics, compared to Ladakh 168, 174  
 poverty and reproductive health 166–167, 168–169  
 reproductive health in 166–174  
 Indian migrants to Ladakh 79, 96  
 birthweight of 97, 98, 185  
 mothers, characteristics of 98  
 Indian military  
 Ladakh Scouts 52, 79–94, 95  
 presence in Ladakh 21, 47, 60, 190–202
- Individualism  
 subsumed to household 51, 61, 132, 188–189, 190, 206
- Indus River 41, 42, 43
- Inequality (*see also* stratification; socioeconomic status; women's status; gender) 1–8
- Infant health (*see* infant morbidity)
- Infant morbidity  
 affected by mobility 135, 139, 184, 195  
 anemia 138  
 caused by gastrointestinal infection 121–124, 135–137, 163, 183, 201  
 caused by respiratory disease 135–136, 138–139, 155, 183, 200–201  
 causes of hospital admissions 124–138  
 diet and (*see* breastfeeding; supplementation)  
 gender differences in 122–123, 134  
 malnutrition as a cause of 119, 121–123  
 seasonality of 123

## 236 Index

## Infant mortality

- at high altitude 32–35, 152, 161, 166
- birthweight, effect on in general 17, 27, 32, 72, 105, 107, 171–173
- birthweight, effect on in Ladakh sample 6, 111–115, 151–154, 179, 186
- birthweight, effect on modified at high altitude 4, 32–34, 111, 151–153
- causes of, at Leh hospital 119–121
- compared with other Himalayan populations 161–166
- compared with the Andes 151–156
- deaths in the hospital 67, 116–118
- deaths in the study 110–111
- gastrointestinal disease, as a cause of 35, 119, 135–137, 155, 161–163, 183, 201
- gender differences in 34, 111–112, 114–115, 161–174
- gestational age, effect on 33, 111–114, 182
- global patterns of 107, 123–124, 195–197, 208
- in North India 169–170, 171–177, 195–196
- in the Andes 34, 151–156
- Ladakhi perspectives on infants at risk 113
- pattern of, in Ladakh 6, 116–119, 151, 153–154, 182, 183–184
- policies to reduce, in Ladakh 23–24, 193–203
- Ponderal Index, effect on 111, 113–114, 182
- protein-energy malnutrition as a cause of 119, 121–123
- proximate determinants of, in general 19, 20, 106–108, 178–179
- proximate determinants of, in Ladakh 179–184, 193–195
- rate (IMR) 195–197, 207, 208
- rates, in Ladakh 5–6, 60, 116–117, 186, 187–196

- respiratory disease, as a cause of 35, 111, 119–120, 155, 161–163, 183, 200–201
- seasonality of 115–116, 119–121, 147, 183
- septicemia, as a cause of 119, 127, 175, 182–183, 194–200
- Infanticide 133, 154
  - gender differences in 53, 154
- Infectious disease (*see also* respiratory, gastrointestinal infection; septicemia) 1, 11–12, 31–33, 73, 106–135, 137–140, 187–191
  - among Ladakhi children 136, 137
  - at high altitude 25, 31, 32, 137, 155, 163, 176
  - gender differences in 119, 122–123, 176, 184, 189
  - seasonality of 126, 155, 183, 184
- Inheritance 51, 52, 142–143, 185
- Interventions (*see* health interventions)
- Interviews
  - with mothers 75–77, 108
- Iodine (*see also* goiter) 15–16
- Islam (*see* religion; Muslims)
- Jammu-Kashmir 2
- Jaundice, neonatal 71, 110, 133
- Kargil (western Ladakh) 43, 77
- Kashmir 2
  - India-Pakistan conflict over 46, 63–202, 205
  - road, connecting Ladakh 43, 46
- Kerosene
  - poisoning among children 140, 191
- Labor (*see* children's work; work, workloads, childbirth)
- Lactational infecundability 35, 105–137
- Ladakh
  - as a political entity 2, 46
  - average birthweight in 5–6, 82, 83–85, 111, 146, 182

- Buddhism in 43–45, 51–52, 131  
 comparative perspectives on  
   17–18, 22–23, 39–40, 85,  
   146–177  
 cultural ecology perspectives on  
   18, 39–40, 184–185, 186  
 culture 2  
 ecology 2, 39–41  
 geography 2, 39–43  
 health in 5, 60–61  
 history of 45–49  
 infrastructural development in 21,  
   46–47, 190–202  
 integration into modern India 18,  
   49, 166, 176–177, 189–190,  
   191–192  
 language in (Ladakhi) 63, 65  
 map 40–43, 205  
 migration into 45, 47  
 population distribution 41–43  
 population growth in 6, 47, 51,  
   185–193  
 population origins 45, 150, 185,  
   206  
 rainfall 2, 41  
 religious conflict in 47–49, 57,  
   79–90, 98, 181, 190  
 road access to 43, 46  
 seasonality in climate 2–4, 40–41,  
   126, 127–135, 183–189  
 tourism 21, 41–43, 47, 95, 159,  
   190–192  
 urbanization 47, 191–192  
 Ladakh Scouts 52, 79, 94, 95  
 Lahdol, Dr. Tsering 63, 68–69,  
   81–129, 132–140, 171,  
   190–199, 200–202, 207  
 Lama 51–52, 57, 101, 125, 133–141  
 Landholdings 49, 76–99, 190  
   and birth outcome 89, 95, 115,  
   180–181, 192  
 LEDeG 201  
 Leh (capital of Ladakh) 41–43,  
   45–47, 78–79, 140, 190,  
   191  
   District 77–78  
   District, Hill Council status 49  
   hospital (Sonam Norbu Memorial)  
     52, 58–59, 101, 140, 171,  
     198  
   population growth in 47, 191–192  
   sanitation in 47, 136–137,  
     191–192, 201  
 Leh Nutrition Project (LNP) 60,  
   138–140  
 Length at birth 28–29  
   at high altitude 28–29  
   in Ladakh 74–84, 111–114, 149  
 Leonard, W. R. 3–4, 15, 30–31, 94  
 Levine, N. E. 51, 134–143, 163–165  
*Lhabal/llhamo* 6, 26, 58, 69  
   usage during pregnancy 100, 200  
   usage for infants and children 141  
*Lhu* 49, 136, 201  
 Life expectancy 12, 205  
 Little, M. A. 15–17, 26, 185  
 Logistic regression  
   compared with hazard analysis  
     110, 207  
 Low birthweight (LBW) 32, 72, 111,  
   167, 168–171, 197  
   effect on mortality, in general 17,  
     27, 32, 72, 105, 107, 171–173  
   effect on mortality at high altitude  
     33–34, 113, 153, 161  
   effect on mortality, in Ladakh 6,  
     111–115, 151–154, 179, 186  
   frequency at high altitude 29, 33,  
     147, 148–158  
   frequency in Ladakh 6, 83, 84,  
     113, 138, 147, 148, 174,  
     182  
 Lung volume (*see also* chest  
   circumference)  
   among high altitude populations  
     26, 27  
 Malaria 31, 137  
 Malnutrition 1, 30–31, 32, 60, 106,  
   195  
   as a cause of infant morbidity 119,  
     121–123  
   as a cause of infant mortality 119,  
     121–123

## 238 Index

Malnutrition (*cont.*)

- among Ladakhi children 136, 137, 150, 159
- among mothers in Ladakh (*see also* maternal anthropometry) 5–6, 33, 161

*Man in the Andes* 17Marriage (*see also* polyandry) 2

- age at 100, 169, 170
- in Ladakh 37, 50–51, 52

## Maternal anthropometry 73–75, 82–83, 108

- compared with Andean women 148, 149–150
- compared with North Indian women 168, 174
- compared with Tibetan and Sherpa women 157–160, 161
- differences between Muslims and Buddhists 98–100
- ethnic variation in, in Ladakh 97, 98
- height 73–82, 83, 84, 159
- skinfolts 73–83, 84, 97, 149, 157, 159–160
- weight 73–82, 84–97, 149–157, 159–160, 180

## Maternal characteristics

- age 72–76, 82, 157–159
- age at first birth 100, 169, 170
- age at marriage 100, 169, 170
- of migrants in Ladakh 98
- of North Indian women 168, 174
- parity 72–76, 81, 149, 157–159

## Maternal factors

- predicting birthweight, in Ladakh 86–100, 101, 149–151, 179–182, 197–200
- related to birthweight, in general 6, 71–73, 86–87, 107

## Maternal health 5–6, 33, 161

- link to infant health and survival 6, 72, 107, 115, 197

## Maternal mortality 67

## McKeown, T. 194

## Measles 121–122, 137

- vaccination 137

## Meat

- consumption during pregnancy 5, 76, 88, 89
- in Ladakhi diet 49, 56, 57

## Medical anthropology 62

- and health policy 193–195, 196–197
- and human adaptability 7–23

## Menarche

- at high altitude 35–36

## Menstruation

- at high altitude 3, 36
- last menstrual period (LMP) 76–83

## Methods

- 24-hour dietary recall 76–77
- analysis of mortality 108–110
- diet and activity questions 76–77
- interviews with mothers 75–77, 108
- maternal and neonatal anthropometry 73–75, 82–83, 108
- reproductive histories 76, 115–118

## Migrants

- birth outcomes of, in Ladakh 97, 98, 185
- birthweight of, at high altitude 4, 29, 98, 146–149
- descend to low altitude for pregnancy 3–4
- into Ladakh 79, 96
- maternal characteristics of, in Ladakh 98
- Spanish, at high altitude 3, 35

## Military

- employment (*see* men's employment; Ladakh Scouts)
- Indian, in Ladakh 21, 47, 60, 190–202

## Millard, A. V. 19–20, 106–108, 179

Milk (*see* dairy products)Miscarriage (*see* fetal death) 15, 105, 172

## Moore, L. G. 3–4, 25, 26–27, 90, 91, 147–151, 157

- Morbidity (*see also* infant morbidity, child health)  
causes of, in Ladakh 60–61
- Mortality (*see also* fetal, infant, neonatal, perinatal, postneonatal, child mortality)  
causes of, in Ladakh 60, 192  
maternal 67
- Muslims 43, 45  
birthweight of, in Ladakh 98–100, 115, 181, 192  
conflict with Buddhists, in Ladakh 47–49, 57, 79, 90, 98, 181, 190  
diet and workloads during pregnancy of, in Ladakh 99–100, 181  
maternal characteristics of, in Ladakh 98–100
- Mutation 10, 11, 26, 37, 38
- Naming  
of infants 125, 184
- Natural selection (*see also* adaptation, evolutionary theory) 10–13, 186
- Neglect of infants 132–134, 154, 164
- Neonatal health 125–134  
hospital admission diagnoses 122, 123
- Neonatal mortality  
as a proportion of infant mortality 6, 116–119, 151, 153–154, 182, 183–184  
compared with North India 169–170, 171–177, 195–196  
compared with other Himalayan populations 161–166  
compared with the Andes 151–156  
gender differences in, in Ladakh 117, 182  
in Ladakh 6, 112–118, 161, 182–183, 186–193  
in the Andes 34, 151–156  
in the Leh hospital 67, 116–118  
policies to reduce, in Ladakh 23–24, 193–203  
policy perspectives on 193–195, 201–202
- Ponderal Index, effect on 111–114, 182  
predicted by birthweight in Ladakh 6, 111–115, 121, 151–154, 182  
seasonality of 115–116, 119–121, 147, 183
- Neonates  
anthropometry of 73–75, 82–83, 108  
chest circumference 74, 97, 111–112  
estimated gestational age of 71, 76–83, 114, 149  
head circumference 71, 74, 111–112, 149  
length 74, 84, 111–114, 149  
Ponderal Index 86, 93, 150  
range of variation in 71–72  
size of, determinants of 6, 71–73, 86–87, 107  
skinfolds (fatness) 71, 74, 111–112, 149  
weight (*see* birthweight) 5–6, 82, 83–85, 111, 146, 182
- Nepal 2, 62, 79, 134–143, 163–165
- Nepalis in Ladakh 98
- Newborns (*see* neonates)
- Norberg-Hodge, H. 5, 18, 51, 185
- Nubra Valley 43
- Nutrition (*see also* malnutrition; protein-energy malnutrition)  
in Ladakh 5, 60–61
- Nyingka* 100–101
- Occupation  
in relation to infant mortality 115  
in the sample 76–79, 96
- Osmaston, H. 4, 18, 49, 50, 61, 185
- Ovulatory function  
at high altitude 36, 37
- Oxygen 3, 12–18, 26–30, 94, 126–136, 197–198  
and biological function 3, 4–5, 25, 26–27  
flow to fetus 4, 28, 29–34, 91, 94, 161, 182

Cambridge University Press

0521830001 - An Ecology of High-Altitude Infancy: A Biocultural Perspective

Andrea S. Wiley

Index

[More information](#)

## 240 Index

- Oxygen (*cont.*)  
 saturation, among high altitude infants 35, 126, 127, 197  
 saturation, at high altitude 27
- Parasitic infection  
 among Ladakhi children 136, 137
- Parity  
 as a predictor of birthweight 87–88, 93, 117–118, 157  
 in relation to infant mortality 115–116, 118, 142, 164–169  
 of women in sample 72–76, 81, 149, 157–159
- Patrilineage 50–53, 143
- PEM (*see* protein-energy malnutrition)
- Perinatal mortality (*see also* fetal death and neonatal mortality) 117, 118, 121, 154, 161, 171, 200, 205
- Placenta  
 morphology and function at high altitude 28
- Plasticity (*see also* adaptability) 7–8, 10
- Polyandry 5, 19, 37, 51, 185–186  
 and women's status 5, 51, 164
- Pollution 37  
 air, in Leh area 135–136, 191  
 domestic 18, 99, 126–127, 182–200  
 outdoor, and infant health 135–136, 191  
 water contamination 128–136, 137, 163, 184, 191
- Ponderal Index (PI) 85–86  
 comparison of Ladakhis with other populations 148, 149, 150  
 effect on neonatal/infant mortality risk 111–114, 182  
 of Ladakhi newborns 86, 93, 150  
 sex differences in 86
- Population  
 definition of 8–9  
 growth, in Ladakh 6, 47, 51, 185, 193  
 history and adaptive status 4, 11, 25–26, 150–151, 185–186  
 history, at high altitude 25–26, 150–151, 160–161, 185–186  
 in biocultural approaches 8–11  
 origins, in Ladakh 45, 150, 185, 206  
 variation in response to hypoxia 27, 105–106, 146–147, 150–151
- Postneonatal mortality (*see also* infant mortality) 6, 34, 119–134, 135–142, 151–153, 156, 183–184
- Postpartum  
 infecundability 35, 105, 137  
 seclusion 108, 125, 173–175, 183
- Potatoes 4, 31, 49, 65, 155
- Poverty 1, 15, 16, 201  
 and reproductive health, in north India 166–167, 168–169  
 biology of 7–8, 9
- Pre-eclampsia (*see* pregnancy-induced hypertension)
- Pregnancy (*see also* fetal growth, birth outcome)  
 and women's workloads, in Ladakh 4–6, 76, 77–89, 150, 198–199  
 as a time of dietary change, cultural beliefs about 2, 73, 159–160, 168–169  
 complications of, at high altitude 28  
 descent to low altitude, by migrants 3–4  
 diet during, beliefs about in Ladakh 5, 89–90, 181, 187–188  
 diet during, in Ladakh 76, 88–91, 150, 157, 180–182, 198–199  
 diet during, variation by parity 94  
 hypertension in 28, 91, 182  
 placental function and morphology at high altitude 28  
 problems encountered during 77, 100, 178, 203

- studies of dietary supplementation and effect on birthweight 88, 198
- usage of health care during 100–104
- views of, by Ladakhis 100–103, 181, 187–188
- Pregnancy-induced hypertension (PIH) 28, 91, 198–200
- effect on birthweight 28, 91, 182–198
- frequency at high altitude 28, 91, 182
- Prematurity (*see also* gestational age) 32, 33–205
- Prenatal care 1, 68, 76, 100, 101–103, 157, 170, 171–175, 181
- effect on birthweight 101, 181–200
- Progesterone
- levels in high altitude populations 36
- Protein
- in Ladakhi diet 5, 60
- Protein-energy malnutrition (*see also* malnutrition)
- among Ladakhi children 136, 137, 150, 159
- as a cause of infant morbidity 119, 121–123
- as a cause of infant mortality 119, 121–123
- Proximate determinants
- analysis 19, 195
- historical component added 19, 179
- of fertility 35
- of infant mortality in Ladakh 179–184, 193–195
- of infant/child mortality, in general 19, 20, 106–108, 178–179
- Rainfall 2, 41
- rdun* 125
- Reflexivity
- in human biological research 21, 61–62
- Religion
- Buddhism in Ladakh 43–45, 51–52, 131
- Buddhist–Muslim conflict 47–49, 57, 79, 90, 98, 181, 190
- Buddhist–Muslim differences in birth outcome 98–100, 115, 181, 192
- Buddhist–Muslim differences in diet and workloads 99–100, 181
- Buddhist–Muslim differences in maternal characteristics 98–100
- distribution, among women in sample 76–77
- Reproduction (*see also* fertility, pregnancy, birth outcome) 1–2, 15, 187
- at high altitude 3–4, 27, 35–37
- competing with production in Ladakh 6, 186–189
- culture and 2
- population variation in 1–2
- Reproductive ecology 17
- Reproductive health 5–6, 16–19, 63–64, 186–189, 192–203
- comparative perspectives on 17–18, 22–23, 39–40, 85, 146–177
- conducting research on, in Ladakh 21, 61–63, 70
- factors influencing, in Ladakh 1–2
- in North India 166–174
- policies to improve, in Ladakh 23–24, 193–203
- Reproductive histories 76, 115–118
- Reproductive success 4–13, 27, 105
- Research questions 17, 21–23, 62–63
- Resources (*see also* socioeconomic status, poverty)
- access to, and health 12–13
- distribution, within the household 18–19

## 242 Index

- Respiratory infection 18, 34, 60, 191  
 and infant health 135–136,  
 138–139, 155, 183, 200–201  
 as a cause of neonatal/infant  
 mortality 35, 111, 119–120,  
 155, 161–163, 183, 200–201  
 as a cause of pediatric hospital  
 admission 121–123, 124  
 at high altitude 31–32, 35, 135  
 gender differences in 119,  
 122–123, 176, 184, 189  
 interactions with domestic  
 pollution 99, 126–127, 135,  
 156, 183–189  
 interactions with hypoxia at high  
 altitude 34–35, 124, 176, 183  
 seasonality of 126, 155, 183, 184  
 Respiratory Syncytial Virus (RSV)  
 127–128  
 Rockies (*see* Colorado)
- Salt (*see also gur-gur cha*)  
 and hypertension 61, 91  
 in Ladakhi diet 56–61, 91, 191  
 Sample characteristics 21, 73–74,  
 77  
 biases in 63, 77–81  
 education 76–80, 82  
 ethnic composition 76–77, 79  
 occupation status 76–79, 96  
 religion 76–77  
 representativeness of Ladakhi  
 population 63, 77–81  
 residence patterns 77–79, 80–81  
 sex ratio in 81, 149  
 socioeconomic 77–81  
 Scheper-Hughes, N. 17, 108, 194,  
 201  
 Seasonality  
 at high altitude 38  
 in biomedical health care usage  
 120, 140  
 in births 116–120, 121  
 in birthweight, in Ladakh 94–95,  
 120, 181–182  
 in climate in Ladakh 2–4, 40–41,  
 126, 127–135, 183–189  
 in food availability and diet 4,  
 31–38, 55–56, 64, 89, 94–95,  
 138, 181–182  
 in infant morbidity 123  
 in infectious disease 126, 155, 183,  
 184  
 in neonatal and infant mortality  
 115–116, 119–121, 147, 183  
 in workloads 5, 38, 49, 91–92,  
 94–95, 129, 140, 181–182, 202  
 Septicemia  
 as a cause of neonatal mortality  
 119, 127, 175, 182–183,  
 194–200  
 Sex (*see also* gender)  
 differences in infant mortality 34,  
 111–112, 114–115, 161–174  
 differences in infant/child  
 morbidity 122–123, 134  
 differences in birthweight 29,  
 73–83, 84–85, 148  
 differences in birthweight, at high  
 altitude 29, 149, 157  
 Sexually transmitted disease (STDs)  
 37  
 Shamanism (*see also lhamo/lhaba*) 6,  
 26, 58, 69  
 Sherpa populations  
 birthweight among 30, 92,  
 147–157, 159–160  
 pregnancy and birth outcome,  
 compared with Ladakh  
 147–158, 166  
 maternal characteristics of  
 157–160, 161  
 Skinfolds  
 of mothers 73–83, 84–97,  
 149–157, 159–160  
 of neonates 71, 74, 111–112, 149  
 Smoking (*see also* carbon monoxide;  
 domestic pollution)  
 and birth outcome 73, 99, 150, 157  
 Socioecology (*see also* stratification,  
 poverty, household) 2–6, 8, 125  
 Socioeconomic status (*see*  
 stratification, sample  
 characteristics)



- and growth in the Andes 15, 30–31, 150, 156, 207
- and health 12, 15–16, 194–195, 201–202
- and variation in birth outcome 1, 19, 72, 106–108, 150–154, 181–201
- and variation in birth outcome, in Ladakh 18, 95–96, 97–98, 115, 150, 156, 180–181, 186
- influences responses to hypoxia 3, 4, 30–31, 105–106, 185–186
- South America (*see* Andes) 3, 15–17
- Spanish
- in the Andes, problems with reproduction 3, 35
- Srinagar (*see also* Kashmir)
- Stillbirths (*see* fetal death) 37, 67, 82, 115–116, 118, 199
- Stratification (*see also* poverty, inequality)
- and health 12, 15–16, 194–195, 201–202
  - in relation to birth outcome in Ladakh 18, 95–96, 97–98, 115, 150, 156, 180–181, 186
  - and growth in the Andes 15, 30–31, 150, 156, 207
- Stressors 3–10, 25
- adaptation to 7–8, 14
- Subsistence (*see* agriculture)
- Supplementation
- of Ladakhi infants 129, 137, 155, 183, 184
  - studies of dietary supplementation and birthweight 88, 198
- 24-hour dietary recall 76–77
- Tamang
- pregnancy among 160, 161
- Tetanus 127, 173, 175, 207
- vaccination against, during pregnancy 76, 127, 170
- Thomas, R. B. 12–13, 14–16
- Tibet (*see* Himalaya) 2, 46, 98
- history of habitation 25, 160
- Tibetan populations (*see* Sherpas, Tamang, Himalaya, Nepal)
- adaptations to hypoxia 27
  - average birthweight among 29–30, 147–157
  - birth outcome, compared with Ladakhis 157–166, 185
  - birthweight of, in Ladakh 96–98, 157–159, 181–185
  - breastfeeding patterns among 163–164
  - child growth and development in 157, 163
  - childcare patterns in 134, 143, 163–165
  - infant mortality in 161–166
  - maternal characteristics of 157–160, 161
  - migrants to Ladakh 45, 46, 79
  - mothers, in Ladakh 97–98
  - plateau 2, 39–40
  - workloads of women in 157, 159–160
- Tibetan medicine 6–7, 15, 57–58
- and infant health 141–142
  - usage during pregnancy 100–101, 199
  - views on pregnancy 101–103, 207
- Tourism
- contributes to social stratification 192, 202
  - in Ladakh 21, 41–43, 47, 95, 159, 190–192
- Traditional Birth Attendants (TBAs) 103–104, 170–173, 199
- TransHimalayan (Tibetan) plateau 2, 39–40
- Typhus 31
- Urbanization 47, 191–192
- Urinary tract infection 99
- Uterine blood flow 4, 28, 29, 34, 91, 94, 161, 182
- UV (solar) radiation 3, 25–26, 37, 41

Cambridge University Press

0521830001 - An Ecology of High-Altitude Infancy: A Biocultural Perspective

Andrea S. Wiley

Index

[More information](#)

## 244 Index

## Vaccination

- BCG and polio 125
- measles 137
- tetanus toxoid, during pregnancy 76, 127, 170

## Ventilation

- as an adaptation to hypoxia 26, 27–29

Vitzthum, V. J. 17, 35, 36, 154–155, 208

## Water

- as a limiting resource in Ladakh 41, 186, 205–206
- contamination of 128, 136, 137, 163, 184, 191

## Weaning

- in relation to child health 139
- of Ladakhi children 139

Weight (*see also* birthweight)

- of mothers in the sample 73, 82, 84–97, 149–151, 159–160, 180

Well-being 11, 13–14, 27

Women (*see* maternal anthropometry, characteristics)

- employment of 46–47, 52, 80, 190
- health of, linked to infant health 6, 72, 107, 115, 197
- role, in household 53–55, 93–94
- workloads of, during pregnancy 4–6, 76, 77–89, 150, 198–199

## Women's status

- and health 5, 53, 188–189
- in Ladakh 5, 53–55, 188
- related to Buddhism 5, 52
- related to polyandry 5, 51, 164

## Work

- children's 55, 143, 144, 165, 192, 207

under hypoxic conditions 4–5, 6, 94, 182

value of women's productive work 5, 186–189

## Workloads 1, 4, 5, 53

beliefs about during pregnancy, in Ladakh 5, 89–90, 181, 187–188

conflict between production and reproduction 6, 186–189

during pregnancy and household dynamics 5, 93–96, 169, 180–181, 186–189

during pregnancy, questions about 76–77

effect on birthweight 91–96, 99–100, 150, 161–164, 180–182, 192–198

in relation to infant feeding 129–137, 155–163, 183, 198

of Himalayan women 157, 159–160

of primiparous women 53, 93–94, 169, 186–188

seasonal variation in 5, 38, 49, 91–92, 94–95, 129, 140, 181–182, 202

social factors contributing to variation in 18, 95–96, 97–98, 115, 150, 156, 180–181, 186

women's contributions to agriculture 5, 50, 52–53, 76–77, 95, 186–187

women's during pregnancy 4–6, 76, 77–89, 150, 198–199

World Health Organization (WHO) 6, 72, 85, 163, 174

Zangskar 41–43, 77