**Index**

**A, B, C**

- accelerated failure time, 18, 20, 30, 139
- hazards model, 27
- additive hazards model, 29

**Application**

- birth weight, 142, 153
- burn patients, 161
- carcinoma of the oropharynx, 86
- cardiac surgery, 132, 142
- COPD, 107, 142, 151, 153
- cystic fibrosis, 158
- drug users, 142
- exposure to asbestos, 147
- hip fracture, 155
- kidney dialysis, 142
- length of stay, 142
- limb injury, 147
- lung cancer, 142, 147, 150
- malignant melanoma, 72, 127, 142
- mastitis, 159
- multiple myeloma, 148
- Nurses’ Health Study, 134
- renal failure, 118
- soft tissue sarcoma, 142
- STI, 123, 142

**Bayesian analysis**, 88, 107, 161

**Bernoulli process**, 59

**Birnbaum-Saunders distribution**, 74, 76

**Brownian motion**, 59, 71, 136, 138

**Burr distribution**, 47

**Case-control study**, 145, 147

**Censoring**, 4, 81, 87

**Clinical trial**, 27, 36, 86, 91, 107, 129, 148, 150, 151

**Cohort study**, 144

**Competing risks**, 118, 121, 122, 130, 160

**Complementary log-log**, 52

**Cook’s distance**, 98

**Covariate**

- ancillary, 104
- defined, 104
- external, 104
- internal, 104

**Cox model**, 11, 33, 36, 38, 50, 52, 56, 100, 103, 123, 132, 134, 141, 147, 153, 155, 162

- in reliability, 35

**Cumulative hazard**, 3, 29

**Cured fraction**, 12, 43, 63, 73, 116, 122, 125, 132, 150, 157, 161, 162

**Current status data**, 51

**D, E, F**

**Defective distribution**, 12

**Inverse Gaussian distribution**, 64, 161

**Degradation**, 76, 78, 119, 128, 129

- shock model, 155, 156
demography, 2, 12, 25
diagnostics, 36, 89, 97, 129
discrete lifetime data, 47
Weibull distribution, 48
distribution
  Birnbaum-Saunders, 74, 76
  Burr, 47
defective inverse Gaussian, 64, 85, 88, 161
discrete Weibull, 48
  Erlang, 60, 139
  exponential, 5, 48, 57, 156
  extreme value, 8
  Fréchet, 156, 158
gamma, 10, 46, 70, 76, 152
generalized linear models, 9, 49, 82, 87
  gamma distribution, 10, 46, 70, 76, 152
GAMLSS, 10, 83
Gamma process, 59, 76, 78, 137, 138
Gompertz distribution, 12, 31, 63
Gumbel distribution, 18, 30
  hazard function, 2
  rate, 35, 46, 56
health worker effect, 144, 146
heterogeneity, 45, 107, 118, 144
immunes, 45, 63, 162
integrated Brier score, 73
interval censoring, 49, 50, 87
intervention, 150
inverse Gaussian, 3, 10, 46, 58, 61, 64, 65, 74, 77, 90, 123, 131, 147, 154, 159
log-logistic, 23, 31, 32
log-normal, 31
Marshall-Olkin extended, 24
negative binomial, 59, 152
negative Gompertz, 12
phase-type, 57
Poisson, 9, 60, 152
positive stable, 46
Ricciardi-Sato, 71
sinh-normal, 75
truncated normal, 108, 110, 112
Weibull, 3, 5, 30
EM algorithm, 87
empirical model, 55
Erlang distribution, 60, 139
experiments, 19, 21, 35
exponential distribution, 5, 48, 57, 156
extreme value distribution, 8
failure rate, 2
first hitting time model, 58, 68, 71, 74, 82, 97, 104, 119
Frechet distribution, 156, 158
frailty, 45, 46, 60, 107, 109
G, H, I
GAMLSS, 10, 83
gamma distribution, 10, 46, 70, 76, 152
  process, 59, 76, 78, 137, 138
generalized linear models, 9, 49, 82, 87
gamma distribution, 77, 78
Gompertz distribution, 12, 31, 63
  hazard function, 12
  survival function, 12
grouped data, 49
Gumbel distribution, 18, 30
hazard function, 2
  rate, 35, 46, 56
healthy worker effect, 144, 146
heterogeneity, 45, 107, 118, 144
immunes, 45, 63, 162
integrated Brier score, 73
interval censoring, 49, 50, 87
intervention, 150
inverse Gaussian distribution, 76
Gaussian distribution, 3, 10, 46, 58, 61, 64, 65, 74, 77, 90, 123, 131, 147, 154, 159
hazard function, 67
  process, 77, 78
K, L, M
Kaplan-Meier estimate, 14, 20, 63, 73, 84, 85, 126, 129, 132, 138, 146, 147, 149, 160
lasso, 101
life tables, 49
linear regression, 9, 17, 55, 119
log-logistic distribution, 23, 31, 32
log-normal distribution, 31
likelihood displacement, 98
logistic regression, 22, 35, 51, 119
longitudinal data, 130
maintenance, 78, 119
marker process, 79, 104, 128, 129
Markov
chain models, 60
chain Monte Carlo, 161
process, 57, 105
Marshall-Olkin extended distribution, 24
mean residual life, 3, 25
misspecification, 38, 73, 95
mixture
distribution, 148, 154
model, 44, 45, 74, 84, 120, 121, 148, 162
model
empirical, 55
fitting, 10, 82
statistical, 55
substantive, 56
validation, 36
multi-parameter regression, 11, 83, 100
multicollinearity, 91, 93

N, O, P, R
negative
binomial distribution, 59, 152
Gompertz distribution, 12
normal distribution, 65, 69, 70, 74, 75, 78, 108, 112, 118, 128, 129
omitted covariates, 37
Ornstein-Uhlenbeck process, 60, 71
outliers, 16, 89
partial likelihood, 34, 37, 105
phase-type distribution, 57
Poisson
distribution, 9, 60, 152
process, 60, 136, 139, 151
positive stable distribution, 46
proportional
hazards model, 11, 56
generalized, 13
linear, 13
mean residual life model, 25
odds model, 22, 68
reversed hazard rate model, 26
random shocks, 155, 156
randomized
drift, 69, 70, 86
starting level, 70
recurrent events, 35, 46, 106, 110, 151
regression model, 9
reliability, 2, 19, 28, 30, 35, 36, 119, 128, 129
renewal process, 106
repairable system, 30, 35
residuals, 36, 39
Cox-Snell, 40, 41
generalized, 40
martingale, 157
restricted mean survival time, 3
reversed hazard rate, 26
Ricciardi-Sato distribution, 71
risk set, 34

S, T, V, W
selection effects, 46
semi-
Markov processes, 60
parametric, 28, 34, 38, 125
regression, 33
sexually transmitted infections, 123
sinh-normal distribution, 75
statistical model, 55
stratification, 36, 155
substantive model, 56
surrogate response, 79
survival function, 2
susceptibles, 45, 84, 162
switching, 148
threshold regression, 62
time scale
operational, 4, 72, 135, 143, 146
transformation, 78, 125, 130, 139, 140, 143, 145, 147, 148
time-varying
coefficients, 29
covariates, 104
truncated normal distribution, 108, 110, 112
truncation, 4, 87, 150
<table>
<thead>
<tr>
<th>Term</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>variable selection</td>
<td>100</td>
</tr>
<tr>
<td>weakest link</td>
<td>8</td>
</tr>
<tr>
<td>Weibull</td>
<td></td>
</tr>
<tr>
<td>distribution</td>
<td>3, 5, 30</td>
</tr>
<tr>
<td>hazard function</td>
<td>5</td>
</tr>
<tr>
<td>pdf</td>
<td>5</td>
</tr>
<tr>
<td>survival function</td>
<td>5</td>
</tr>
<tr>
<td>regression</td>
<td>41, 96</td>
</tr>
<tr>
<td>Wiener process</td>
<td>58, 59, 61, 64, 65, 69, 73, 76, 78, 82, 104, 131, 139, 141, 143, 147, 151, 153–155, 158, 159</td>
</tr>
</tbody>
</table>