DAFTAR PUSTAKA

Abdi, G. M. (2014). *Pemodelan Prevalensi Kejadian Kusta dengan Pendekatan Spatial Durin Model–SEM PLS*. Surabaya: Thesis Statistika ITS.

Agresti, A. (2012). *Categorical data analysis* (Vol. 792). John Wiley & Sons.

Arkandi, I., & Winahju, W. S. (2016). Analisis Faktor Risiko Kematian Ibu dan Kematian Bayi dengan Pendekatan Regresi Poisson Bivariat di Provinsi Jawa Timur Tahun 2013. *Jurnal Sains dan Seni ITS*, *4*(2).

Best, D. (1999). *Tests of Fit and Other Nonparametric Data Analysis*.

Cameron, A. C., & Trivedi, P. K. (2013). *Regression Analysis of Count Data* (Nomor 53). Cambridge university press.

Draper, N. Smith, H. (1992). *Analisis Regresi Terapan*. Jakarta: Gramedia Pustaka Utama.

Gujarati, D. N., & Porter, D. C. (2010). *Essentials of Econometrics*. McGraw-Hill.

Gustavsson, S. (2015). *Evaluation of Regression Methods for Log-Normal Data*.

Hilbe, J. M. (2014). *Model Count Data*.

Hogg, R., Mckean, J., & Craig, A. (2012). Introduction to Mathematical Statistics Seventh Edition. *Pearson Education*.

Jariwala, D. A., Patel, B. H., Godara, N. R., & Kantharia, S. L. (2013). Socio-Demographic and Environmental Correlates of Leprosy: A Hospital Based Cases Control Study. *National Journal of Community Medicine*, *4*(03), 369–376.

Kaombe, T. M. (2024). A Bivariate Poisson Regression to Analyse Impact of Outlier Women on Correlation between Female Schooling and Fertility in Malawi. *BMC Women's Health*, *24*(1), 55.

Karlis, D., & Ntzoufras, I. (2005). Bivariate Poisson and Diagonal Inflated Bivariate Poisson Regression Models in R. *Journal of statistical Software*, *14*, 1–36.

Kawamura, K. (1973). The Structure of Bivariate Poisson Distribution. *Kodai Mathematical Seminar Reports*, *25*(2), 246–256.

Kemenkes RI. (2022). *Profil Kesehatan Indonesia 2021*. Kementerian Kesehatan Republik Indonesia.

Kerr-Pontes, L. R. S., Barreto, M. L., Evangelista, C. M. N., Rodrigues, L. C., Heukelbach, J., & Feldmeier, H. (2006). Socioeconomic, Environmental, and Behavioural Risk Factors for Leprosy in North-East Brazil: Results of a Case–Control Study. *International journal of epidemiology*, *35*(4), 994–1000.

Kocherlakota, S., & Kocherlakota, K. (2007). *Regression in The Bivariate Poisson Distribution*.

Lukman, A. F., Arashi, M., & Prokaj, V. (2023). Robust Biased Estimators for Poisson Regression Model: Simulation and Applications. *Concurrency and Computation: Practice and Experience*, *35*(7).

Mardalena, S., Purnomo, J. T. D., & Prastyo, D. D. (2021). Bivariate Poisson Inverse Gaussian Regression Model with Exposure Variable: Infant and Maternal Death Case Study. *Journal of Physics: Conference Series*, *1752*(1), 012016.

McCullagh, P., & Nelder, J. (1989). *Generalized Linear Models*. Routledge.

Muharry, A. (2014). Faktor Risiko Kejadian Kusta. *Jurnal Kesehatan Masyarakat*, *9*(2), 174–182.

Nadarajah, S., & Lyu, J. (2022). New Bivariate and Multivariate Log-Normal Distributions as Models for Insurance Data. *Results in Applied Mathematics*, *14*.

Novkaniza, F., Notodiputro, K. A., Sadik, K., & Mangku, I. W. (2023). Poisson-Lognormal Model with Measurement Error in Covariate for Small Area Estimation of Count Data. *Commun. Math. Biol. Neurosci.*, *2023*, Article-ID.

Ong, S. H., Lee, W. J., & Low, Y. C. (2020). A General Method of Computing Mixed Poisson Probabilities by Monte Carlo Sampling. *Mathematics and Computers in Simulation*, *170*, 98–106.

Perrakis, K., Karlis, D., Cools, M., & Janssens, D. (2014). Bayesian Inference for Transportation Origin-Destination Matrices: The Poisson-Inverse Gaussian and Other Poisson Mixtures. Dalam *J. R. Statist. Soc. A* (Vol. 178).

Pieter, Y., & Grijsen, M. L. (2022). Picturing Health: The Burden of Leprosy in Eastern Indonesia. *The Lancet*, *399*(10335), 1588–1599.

Prahutama, A., Suparti, S., Munawaroh, D. A., & Utami, T. W. (2021). Modeling Bivariate Poisson Regression for Maternal and Infant Mortality in Central Java. *AIP Conference Proceedings*, *2329*(1).

Rismawati, D. (2013). Hubungan Antara Sanitasi Rumah dan Personal Hygiene dengan Kejadian Kusta Multibasiler. *Unnes Journal of Public Health*, *2*(1).

Setiani, L., Badar Kirwono, S. K. M., & Artika Fristi Firnawati, S. K. M. (2014). Faktor-Faktor Yang Berhubungan Dengan Kejadian Kusta Di Wilayah Kerja Puskesmas Kabunan Kabupaten Pemalang (Doctoral dissertation, Universitas Muhammadiyah Surakarta).

Shirazi, M., & Lord, D. (2019). Characteristics-Based Heuristics to Select a Logical Distribution Between the Poisson-Gamma and the Poisson-Lognormal for Crash Data Modelling. *Transportmetrica A: Transport Science*, *15*(2), 1791–1803.

Siswanti, S., & Wijayanti, Y. (2018). Faktor Risiko Lingkungan Kejadian Kusta. *HIGEIA (Journal of Public Health Research and Development)*, *2*(3), 352–362.

Smith, C. S., Aerts, A., Saunderson, P., Kawuma, J., Kita, E., & Virmond, M. (2017). Multidrug Therapy for Leprosy: A Game Changer on the Path to Elimination. *The Lancet Infectious Diseases*, *17*(9), e293–e297.

Syadifa, M. Z., & Chamid, I. M. S. (2016). Pemodelan Jumlah Penderita Kusta di Kabupaten Probolinggo Tahun 2014 Menggunakan Generalized Poisson Regression (Gpr). *FMIPA: Institut Teknologi Sepuluh November. Surabaya*.

Tzougas, G., & di Cerchiara, A. P. (2023). Bivariate Mixed Poisson Regression Models with Varying Dispersion. *North American Actuarial Journal*, *27*(2), 211–241.

Walpole, R. E., Myers, R. H., Myers, S. L., & Ye, K. (2016). *Probability and Statistics for Engineers and Scientists*. Macmillan New York.

Wang, Y. (2017). *Multivariate Zero-Inflated Poisson Regression*.

WHO. (2021). *Global Leprosy (Hansen Disease) Update, 2021: Moving Towards Interruption of Transmission*.

LAMPIRAN

LAMPIRAN

Lampiran 1. Data Penelitian

No.	Provinsi	Y1	Y2	X1	X2	X3	X4	X5	X6
1	Aceh	46	208	92	15,53	77,55	431	2683	88,79
2	Sumatera Utara	12	102	205	8,49	82,02	835	5611	90,89
3	Sumatera Barat	8	64	133	6,04	68,68	360	2626	83,4
4	Riau	6	69	75	7	83,64	308	2634	89,76
5	Jambi	6	39	72	7,67	80,36	248	1533	79,7
6	Sumatera Selatan	18	204	93	12,79	77,29	432	2464	84,7
7	Bengkulu	2	13	102	14,43	79,81	205	787	67,39
8	Lampung	6	124	262	11,67	83,89	394	2392	80,2
9	Kepulauan Bangka Belitung	6	43	90	4,67	92,24	92	751	73,4
10	Kepualauan Riau	2	30	258	5,75	91,62	130	1188	90,83
11	DKI Jakarta	36	260	15978	4,67	95,17	511	13921	99,86
12	Jawa Barat	85	1243	1379	7,97	71,66	1474	14784	93,24
13	Jawa Tengah	72	570	1120	11,25	83,28	1203	11974	93,62
14	DI Yogyakarta	1	24	1185	11,91	97,12	205	3017	95,69
15	Jawa Timur	90	1606	855	10,59	80,97	1416	12890	95,02
16	Banten	64	552	1248	6,5	82,89	368	4445	93,51
17	Bali	6	95	755	4,72	95,95	198	3607	97,56
18	Nusa Tenggara Barat	17	153	290	13,83	82,85	218	1412	94,6
19	Nusa Tenggara Timur	25	317	111	20,44	73,36	474	1069	85,4
20	Kalimantan Barat	2	57	37	6,84	78,39	302	1242	78,76
21	Kalimantan Tengah	5	40	18	5,16	73,77	235	973	77,05
22	Kalimantan Selatan	9	64	106	4,56	81,43	288	1529	76,4
23	Kalimantan Timur	14	108	30	6,27	89,77	247	1916	85,8
24	Kalimantan Utara	2	28	9	6,83	79,8	67	420	86,8
25	Sulawesi Utara	31	347	190	7,36	84,85	250	2045	91,65
26	Sulawesi Tengah	14	166	49	12,18	76,06	253	999	88,51
27	Sulawesi Selatan	74	620	196	8,53	91,57	591	3267	91,18
28	Sulawesi Tenggara	9	200	70	11,74	85,62	331	847	91,94
29	Gorontalo	6	115	105	15,41	78,58	110	495	94,57
30	Sulawesi Barat	7	94	86	11,85	80,12	111	385	78,35
31	Maluku	30	302	40	16,3	76,77	254	649	93,21
32	Maluku Utara	52	478	41	6,38	77,11	169	438	88,66
33	Papua Barat	216	565	11	21,82	77,89	184	435	81,68
34	Papua	250	747	14	27,38	40,81	478	888	64,92

Lampiran 2. Uji Asumsi dengan R Studio

a. Deteksi uji distribusi *Bivariate Poisson* Variabel Respon

```
> S2y1 <-sum((y1-mean(y1))^2)/n
> S2y2 <-sum((y2-mean(y2))^2)/n
> m11 <-sum((y1-mean(y1))*(y2-mean(y2)))/n
> IB <- (n*(mean(y2)*S2y1-
2*m11^2+mean(y1)*S2y2))/(mean(y1)*mean(y2)-m11^2)
> db2 <-2*n-3
> chisqpois <- qchisq(1-alpha,db2)
> ujidist <-cbind(IB, chisqpois)
> ujidist #IB<X2
           IB chisqpois
[1,] 66.83781  84.82065
```

b. Uji Korelasi antar Variabel Respon

```
> kor <- cor.test(y1,y2,method="pearson")
> db1 <- n-2
> ttabel <-qt(1-alpha/2, db1)
> ujikor <- cbind(kor$statistic, ttabel)
> colnames(ujikor)<-c("thitung","ttabel")
> ujikor #t>ttabel
  thitung   ttabel
t 4.70086 2.036933
```

c. Uji Overdispersi Menggunakan *Deviance*

```
> Dy1 <-2*sum(ifelse(y1==0,0,y1*log(y1/mean(y1))-(y1-
mean(y1))))
> Dy2 <-2*sum(ifelse(y2==0,0,y2*log(y2/mean(y2))-(y2-
mean(y2))))
> dbdev <- n-p-1
> phitopi <-cbind(Dy1/dbdev, Dy2/dbdev)
> phitopi #phi>1
         [,1]     [,2]
[1,] 73.75574 421.2339
```

d. Uji Multikolinieritas antar Variabel Prediktor

```
> modely1 <-glm(y1~X1+X2+X3+X4+X5+X6,data=datasabil)
> modely2 <-glm(y2~X1+X2+X3+X4+X5+X6,data=datasabil)
> vif <-cbind(vif(modely1),vif(modely2))
> vif
           [,1]     [,2]
X1     1.427664 1.427664
X2     1.999397 1.999397
X3     2.568938 2.568938
X4     6.896568 6.896568
X5     8.538021 8.538021
X6     1.781080 1.781080
```

Lampiran 3. Estimasi Parameter dengan R Studio

a. Estimasi Parameter Terhadap $\boldsymbol{\beta}_1$

```
> print(estimasib1)
                  Beta1 exp(Beta1) Standard Error      Z hitung  p-value
(Intercept)1.483486e+00  4.4082846   5.684239e-06 260982.290263  0.000000e+00
X1         1.608040e-05  1.0000161   3.984992e-06      4.035241  5.454629e-05
X2         1.058088e-01  1.1116093   1.147824e-03     92.182021  0.000000e+00
X3        -2.278553e-02  0.9774721   6.253364e-04    -36.437231 1.095985e-290
X4         1.514513e-04  1.0001515   5.513444e-05      2.746945  6.015316e-03
X5         8.616924e-05  1.0000862   5.781667e-06     14.903874  3.110092e-50
X6         1.553394e-02  1.0156552   6.657841e-04     23.331793 2.109564e-120
> cat("Final epsilon:", eps1, "\n")
Final epsilon: 0.000995126
> cat("Number of iterations:", iterasi1, "\n")
Number of iterations: 43
```

b. Estimasi Parameter Terhadap $\boldsymbol{\beta}_2$

```
> print(estimasib2)
                   Beta2 exp(Beta2) Standard Error    Z hitung p-value
(Intercept)  1.0764624366  2.9342810   1.483016e-06 725860.1883       0
X1           0.0001168723  1.0001169   1.039683e-06    112.4115       0
X2           0.0444096707  1.0454105   2.994670e-04    148.2957       0
X3          -0.0337628425  0.9668008   1.631501e-04   -206.9435       0
X4           0.0028777085  1.0028819   1.438456e-05    200.0554       0
X5          -0.0001518152  0.9998482   1.508435e-06   -100.6441       0
X6           0.0626512570  1.0646555   1.737029e-04    360.6806       0
> cat("Final epsilon:", eps2, "\n")
Final epsilon: 0.0007762736
> cat("Number of iterations:", iterasi2, "\n")
Number of iterations: 1
```

c. Estimasi Parameter Terhadap τ

```
> print(estimasit)
             Tau exp(Tau) Standard Error Z hitung p-value
[1,] 0.001647065 1.001648   9.601924e-07 1715.348       0
> cat("Final epsilon:", eps3, "\n")
Final epsilon: 0.0004126037
> cat("Number of iterations:", iterasi3, "\n")
Number of iterations: 469
```

Lampiran 4. Uji Signifikansi dengan R Studio

Uji Simultan

```
> G2=2*(lnlik.BPLNR.sum(tetafix,y,x)-
lnlik.BPLNR.sum0(as.matrix(tetafix[c(1,7,15),]),y,x))
> chi2=qchisq(1-alpha,2*p+1)
> simultan=cbind(G2,chi2)
> colnames(simultan)=c("G^2","X^2")
> simultan #tolak h0 jika G^2>X^2
          G^2      X^2
[1,] 113175.4 24.99579
```

Lampiran 5. Riwayat Hidup Penulis

A. DATA PRIBADI

Nama	: Salsabila Rahmadhani S.
NIM	: H051201068
Tempat, Tanggal Lahir	: Bandung, 16 Agustus 2002
Agama	: Islam
Jenis Kelamin	: Perempuan
Suku/Bangsa	: Makassar, Sunda/Indonesia
Alamat	: Jl. Masjid Jabal Nur No. 16, Maccini Parang
E-mail	: sabilarahmadhani16@gmail.com
No. Handphone	: 081222590423/0882019934587

B. RIWAYAT PENDIDIKAN

1. SD Interaktif Abdussalam (SIAS) Bandung (2008-2012)
2. SDN Sudirman IV Makassar (2012-2014)
3. SMPN 6 Makassar (2014-2017)
4. SMA-IT Darul Istiqamah Maros (2017-2020)
5. S1 Program Studi Statistika FMIPA Unhas (2020-2024)