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THE DEVELOPMENT OF NUTMAP (NUTRITION MAP) STATUS AND STUNTING PREVALENCE IN CHILDREN UNDER-FIVE

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Abstract

Indonesia still faces major challenges with chronic undernutrition among children under-five, which is evidenced by the high prevalence of stunting in children under-five. In order to measure the effectiveness and strengthen the targeting of stunting prevention efforts, the government needs information on the level and distribution of the prevalence of stunting in children under-five at the lower administrative level than the regency/municipality. This activity aims to provide information on the nutritional status of children under-five, including stunting prevalence, up to the village/ward level. The methodology selected to produce the Nutritional Status Map for children under-five was adopted from the Small Area Estimation (SAE) approach developed by Elbers et al. (2003). The estimation model of the nutritional status indicator was determined for each indicator: stunting, wasting, and underweight. The estimation model for each indicator used reference number of the nutritional status prevalence for z-scores of -2 and -3 at the regency/municipality level. In the initial stage, the development of this map was focused on five districts that are included in the 100 priority districts/cities for stunting prevention. Although the coverage area of this map is still limited to five districts, this nutritional status map is expected to be developed comprehensively, starting from priority districts for handling stunting to covering all districts/cities. It is expected that development of the nutritional status map and quantifying stunting prevalence will contribute to improving the system for targeting priority policies to reduce stunting.

Daftar Singkatan

Balitbangkes : *Badan Penelitian dan Pengembangan Kesehatan* (National Institute of Health Research and Development)
GLS : Generalised Least Squares
MoU : Memorandum of Understanding
PKS : *Perjanjian Kerja Sama* (Cooperation Agreement)
Podes : Potensi Desa (Village Potential Statistic)
PovMap : Poverty Map
Riskesdas : *Riset Kesehatan Dasar* (Basic Health Research)
SAE : Small Area Estimation
SP : *Sensus Penduduk* (Population Census)
TNP2K : *Tim Nasional Percepatan Penanggulangan Kemiskinan* (The National Team for The Acceleration of Poverty Reduction)

Background

Indonesia still faces a major challenge with chronic undernutrition among children under-five–which is evidenced by the high prevalence of stunting in children under-five. Stunting is a condition of impaired growth in children under-five due to chronic undernutrition–notably from the status of fetus until the child is 23 months of age. In 2018, the Basic Health Research (Riskesdas) unit of the Ministry of Health found 30.8 per cent of children under-five were stunted. Compared to neighboring countries, Indonesia has the second-highest prevalence of stunting in Southeast Asia after Cambodia.

Responding to these conditions, the Government of Indonesia took the initiative to strengthen efforts to reduce stunting based on the Five Pillars of Stunting Prevention since 2017: (i) the commitment, and vision of, leadership; (ii) national campaigns and communication on behavioural change; (iii) convergence, coordination, and consolidation of the national, regional, and community programs; (iv) food nutritional security; and (v) monitoring and evaluation. Implementation of the five pillars is expected to increase the effectiveness of an integrated nutritional intervention, including nutrition-specific and nutrition-sensitive actions. This integrated intervention needs to be carried out by targeting priority groups in priority locations and through priority interventions. Based on global experience, this is the key to success in improving nutrition and preventing stunting (Levinson and Balarajan 2013). The Government of Indonesia, therefore, determined priority areas for stunting prevention, starting from 100 priority districts/cities in 2018 and 160 priority districts/cities in 2019–with the objective of expanding to all districts/cities gradually until 2024.

In order to measure the effectiveness and strengthen the targeting of stunting prevention efforts, the government needs information on the level and distribution of the stunting prevalence in children under-five at a lower administrative level than the regencies/municipalities. This information can be useful for the government to synchronise various programs, especially the ones that are closely related to the role of subnational government and the role of the community at the subdistrict and village/ward levels. The data set used to identify the nutritional status of children under-five and stunting prevalence is currently the Basic Health Research (*Riset Kesehatan Dasar* or *Riskesdas*) that was published by the Ministry of Health. This data is, however, only valid to display nutritional status at the district/city level. To plan, monitor, and evaluate the success of stunting prevention programs, therefore, requires a database that is adequate to display nutritional status down to the village/ward level.

The Purpose of the Development of Children Under-Five Nutritional Status Map

To support the efforts to converge policies on stunting prevention in Indonesia, TNP2K cooperated with the National Institute of Health Research and Development (*Badan Penelitian dan Pengembangan Kesehatan*: Balitbangkes) of the Ministry of Health to initiate an activity to map the prevalence of nutritional status in children under-five. This activity aims to provide information regarding the nutritional status of children under-five, including stunting prevalence up to the village/ward level. With this information, the government is expected to strengthen the targeting up to the village/ward level, which becomes the priority areas of stunting prevention. In addition, the nutritional status map can also serve as baseline data, which can be a reference when performing the program monitoring and evaluation of stunting prevention.

The collaboration between the TNP2K and *Balitbangkes* was realised in a Memorandum of Understanding (MoU) or Collective Agreement which is applicable for four years from the date of signing of the agreement on 6 August 2018. This agreement serves as a legal umbrella that regulates the cooperation of the health research implementation in efforts to accelerate poverty reduction in Indonesia. The scope of this agreement includes the use of research data in the preparation of policy and planning, research implementation, dissemination and publication, as well as increased resource capacity.

As a follow-up to the Collective Agreement, TNP2K and *Balitbangkes* also compiled a Cooperation Agreement (*Perjanjian Kerja Sama*: PKS) which regulates the technical development of the nutritional status map of children under-five at the village/ward level in more detail. The collaboration with *Balitbangkes* was not just limited to the provision of the required data from both institutions, but also included increased human resource capacity as well as the implementation forum of scientific discussion and dissemination. One of the capacity-building activities that has been carried out was the Small Area Estimation (SAE) method training, which was held in August 2018.

The Methodology for the Development of the Children Under-Five Nutritional Status Map

The methodology selected to generate the Children Under-Five Nutritional Status Map was adopted from the Small Area Estimation (SAE) approach developed by Elbers et al. (2003). It was used to describe the level of poverty and inequality at the level of aggregation of administrative regions at the district level or village/ward. The SAE method has been reviewed by the World Bank and became the main reference of empirical research for the development of the Poverty Map (PovMap). The PovMap could estimate the regression based on consumption, z-score estimation, and others with the composition of selected explanatory variables. The PovMap could generate percentage distribution and a number of outcomes at a certain regional level based on a particular standard measurement as the calculation benchmark.

This method was later developed by Fujii (2005, 2010) to describe the distribution of undernourished and malnourished children in Cambodia at the lowest aggregate-administrative level. In developing this map, the

outcome variables used included the nutritional status of children under-five as measured from z-scores or standardised values. The following are the indicators and their standardised values obtained from *Riskesdas*:

1. The ratio of weight-to-age or weight/age index that indicated nutritional problems in general. Children under-five were categorised as having undernutrition and malnutrition or underweight if the z-score of weight/age is lower than -2;

2. The ratio of height-to-age or height/age index that indicated chronic or acute nutritional problems as a result of a longstanding condition. Children under-five were categorised as short and stunted if the z-score of height/age is lower than -2; and

3. The ratio of weight-to-height or weight/height index that indicated acute nutritional problems as a result of a short-time condition. Children under-five were categorised as thin and wasted if the z-score of weight/height is lower than -2.

In addition to those indicators, development of children under-five nutritional status also requires other information, such as individual and household characteristics that can be obtained from the Population Census and Riskesdas, as well as community or environmental characteristics that can be obtained from administrative data on Village Potential Statistics (*Potensi Desa* or Podes).

Selection of Estimation Variables

The estimation model of nutritional status indicators was determined for each indicator: stunting, wasting, and underweight. The estimation model for each indicator applied the prevalence rate of nutritional status for z-scores of -2 and -3 at the regency/municipality level. Although the estimation of children under-five nutritional status could be carried out using a provincial-level estimation model, this study employed a district-level estimation model to capture the heterogeneity within districts/cities. Estimation was carried out for each nutritional status indicator at the regency/municipality level separately. This study determined six districts as initial models for mapping development throughout Indonesia. As a result, there were 18 models for estimating nutritional status indicators based on the

indicator types and districts/cities (three models for estimating indicators in each district/city). Each model should ideally produce an estimation of at least ± 5% relative difference to the reference point at the regency/municipality level. In addition, the model should also be consistent when the reference point used is changed, for instance, the z-score was less than -2 to -3, and vice versa.

The estimation was initially made when the z-score point was less than -2. If the difference in the aggregated estimation results at the regency/municipality level was still more than 5 per cent relative to the reference point at the regency level from the survey, the model will be adjusted by adding other census variables that were statistically equivalent to the survey variables. The estimation with the created model to determine the rate of nutritional status at point -2 was then carried out when the z-score was less than -3. At this stage, this model frequently had to readjust in the process of selecting both independent variables as well as location and household errors, because the difference in the estimation results could reach more than 5 per cent

relative to the regency/municipality rate. It might be caused by sampling error–for instance, taking too large a sample size due to the small number of samples from the survey, so that the location and household errors from the census estimation were also higher.

In addition to considering the level of significance, independent variables in estimating nutritional status indicators were also selected based on the results of literature reviews. The selected variables were included in the following four characteristics:

1. Parents characteristics:
    a. Mother's education (Beal et al. 2018; Fernalda et al. 2012; Keino et al. 2014; and Mzumara et al. 2018).
    b. Mother's age (Mzumara et al. 2018). Based on the study of Efevbera et al. (2017), pregnancy at a young age is not the only cause of stunting. Early marriage can affect stunting through education and economic status.
    c. Mother's occupation (Keino et al. 2014).
    d. Father's education (Beal et al. 2018; Semba et al. 2008; Vollmer et al. 2016).
    e. Father's employment status (Beal et al. 2018).
2. Household characteristics:
    a. Welfare status (Beal et al. 2018; Fernalda et al. 2012; Keino et al. 2014; Mzumara et al. 2018; Torlesse et al. 2016); could be taken from the welfare index, which was prepared based on asset ownership.
    b. Sources of drinking water (Beal et al. 2018; Mzumara et al. 2018).
    c. Household sanitation (Beal et al. 2018; Keino et al. 2014).
    d. The interaction between sanitation facilities and access to clean water (Torlesse et al. 2016). Stunting risks increased three times higher in households that consumed non-potable water and used poor sanitation.
3. Children characteristics:
    a. Gender (Mzumara et al. 2018; Torlesse et al. 2016).
    b. Age (Beal et al. 2018; Mzumara et al. 2018; Torlesse et al. 2016).
4. Community characteristics:
    a. Lack of access to health facilities (Beal et al. 2018).
    b. Rural areas (Beal et al. 2018).

By applying the findings of this literature review, the independent variables related to the characteristics were selected to estimate the nutritional status indicators in the five districts/cities studied. The number of variables selected ranged from 5-25. Variables mostly selected at the household level included access to sanitation and clean water as well as parents' education. At the village level, the most selected variables were the parents' average education, access to sanitation and clean water, the presence of health infrastructure (Pos Pelayanan Terpadu: Posyandu or Integrated Health Post) and the number of midwives in the village.

The Procedure of Small Area Estimation

Basically, z-score based regression was used to estimate small areas, such as the index of weight/age, height/age, and weight/height. The z-score based regression generated a predicted value which was then used as the basis for calculating the malnutrition rate. In practice, the simulation process using the SAE method utilised population census data to strengthen the estimation power in generating malnutrition rates at the subdistrict or village/ward level.

The PovMap procedure was performed with a series of statistical tests. **The first stage** was the process of matching the categories, types, and variable values between *Riskesdas* and Population Census data. This process was also known as the matching process. Types of statistical tests on continuous variables and categorical variables were distinguished. The independent variables included in the model specification were limited to those that passed the statistical test. Variables constructed from household survey data should have the same operational definition as variables constructed from population census data.

The second stage of the Nutritional Map procedure was the specification of the z-score estimation model–that is, index of weight/age, height/age, and weight/height)–which also included aggregation at village/ward level in survey and census data. This model could be written as follows:

$$\ln y_{ch} = E[\ln y_{ch} | \mathbf{x}_{ch}] + u_{ch} \qquad (2.1)$$

or the model could also be written linearly as:

$$\ln y_{ch} = \mathbf{x}_{ch}'\boldsymbol{\beta} + u_{ch} \qquad (2.2)$$

dengan:

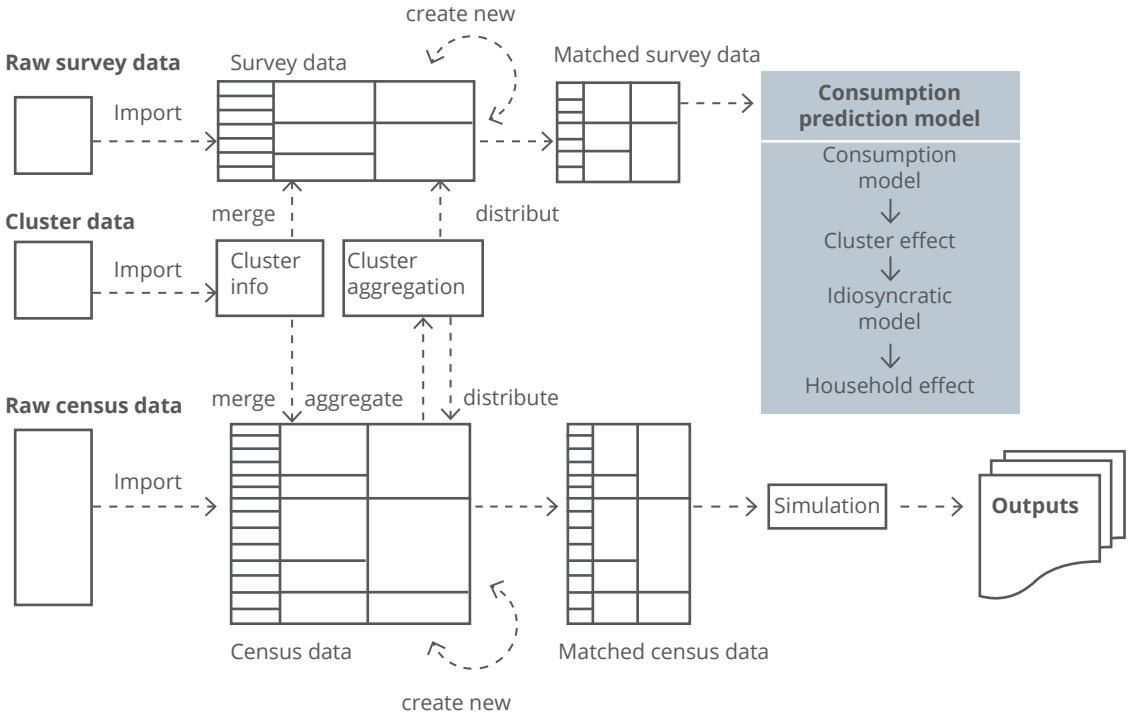
c = cluster representation (village/ward)

h = individual/household in cluster $_c$ (village/ward)

y_{ch} = individual z-score h in cluster $_c$ (village)

$\mathbf{x}_{ch}$ = characteristics of household h in cluster $_c$ (village/ward)

Figure 1: ELL Methodology Flowchart



Source: Zhao and Lanjouw 2006 using PovMap2: A User's Guide, (draft), The World Bank.

As mentioned earlier, this model referred to predictive power so that it was expected to obtain a statistically strong parameter coefficient. The first stage was a z-score based regression model which consisted of household characteristics–known as the **beta model**.

In the third stage, the error term estimation from the beta model was further processed to: (i) construct a variance-covariance matrix to fix the heteroscedasticity problem by decomposing household units and aggregation at the village/ward level. In principle, this approach was similar to the random effect model; and (ii) obtain the variance parameter value on the estimation of the household units and the aggregation of village/ward level for the bootstrap simulation.

The ELL method proposed a logistical transformation of the household units' error term in modeling heteroscedasticity, which was then referred to as the **alpha model**. In summary, it could be written as follows:

$$\ln\left[\frac{e_{ch}^2}{A - e_{ch}^2}\right] = \mathbf{z}_{ch}^T \hat{\boldsymbol{\alpha}} + r_{ch} \qquad (3.1)$$

The estimated variance of the beta model and alpha model was constructed to estimate the generalised least squares (GLS), where the variance-covariance matrix would be:

$$\begin{bmatrix} \sigma_{\eta c}+\sigma_{\varepsilon} & \sigma_{\varepsilon} & \sigma_{\varepsilon} & \sigma_{\varepsilon} \\ \sigma_{\varepsilon} & \sigma_{\eta c}+\sigma_{\varepsilon} & \sigma_{\varepsilon} & \sigma_{\varepsilon} \\ \sigma_{\varepsilon} & \sigma_{\varepsilon} & \sigma_{\eta c}+\sigma_{\varepsilon} & \sigma_{\varepsilon} \\ \sigma_{\varepsilon} & \sigma_{\varepsilon} & \sigma_{\varepsilon} & \sigma_{\eta c}+\sigma_{\varepsilon} \end{bmatrix} \quad (3.2)$$

The estimated GLS coefficient parameter was the initial value for the simulation process employing the bootstrap method. This process performed 100 replications to produce a poverty level at the cluster level. This simulation estimated each individual's z-score value of children under-five in the census.

The fourth stage was the outcome value prediction. At this stage, the prediction of outcome indicators was carried out at an aggregated level. This aggregation level was lower than the aggregation unit at the regional/municipal level by combining the census data information and estimation results at the regional/municipal level.

The fifth stage was Field Verification. Direct verification of the community was conducted in selected areas to ensure that the outcome estimation results mirrored the reality on the ground.

Table 1: Standard Procedure for Nutritional Mapping (NutMap) (2018)

Tahap	Proses
1	Estimating the Beta model according to the equation (2.1)
2	Calculating the cluster effect η_c
3	Calculating the variance estimator $\mathrm{var}(\sigma_{\eta}^2)$
4	Preparing the residual term for the Alpha model estimation
5	Estimating the GLS model under the matrix description in (x.x)
6	Utilising singular value decomposition to break down the variance-covariance matrix from the previous step. It was used to generate a vector from normally distributed random variables so that the combined variance-covariance matrix would match the description in (3.2)
7	Analysing the census data, omitting the observations containing missing values, creating all census variables required for both Beta and Alpha models.
8	Saving all data for the simulation process, which was known as a "PDA" file

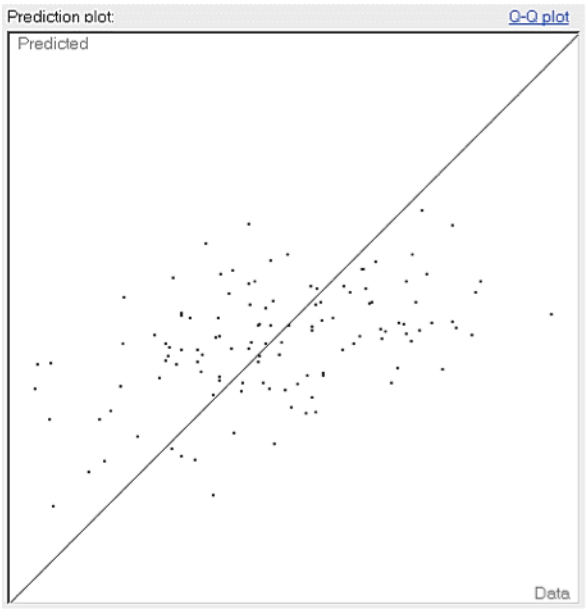
Source: World Bank, Manual PovMap.

SAE utilised other data resources to overcome the issue of estimating representation at smaller levels which became a constraint on survey data through a regression approach. Other data that could be used to increase the estimated representation ability at lower levels were: (i) population census data; and (ii) administrative data at the village/ward, or cluster levels.The information on z-score values and household characteristics was obtained from *Riskesdas*. Then, since the census data had the same household characteristic variables as *Riskesdas*, the estimation results of parameter coefficients obtained through regression with Basic Health Research data could be borrowed to predict the households' z-score contained in the census data. The predicted results for individual units of children under-five were aggregated to the desired level–in this case, the village/ward level. The next section describes an illustration of the process carried out in the SAE Nutrition Analysis at the regency/municipal level, namely the Lampung Tengah District.

As explained in the previous section regarding the variables selection that would be included in the model specification, in the initial test the procedure employed was statistical testing on the variables in the National Socioeconomic Survey (*Susenas*) and Population Census. At the model estimation stage, three types of models were performed, namely: beta model, alpha model, and GLS regression model.

In the beta model, the variables that passed from the preliminary testing stage were involved in the model specification. The regression estimation results were attempted to be statistically significant. The PovMap software package provided stepwise options with both backward and forward techniques. It was essential to consider the behaviour of variables by the type–for instance, whether the included variables were continuous variables or categorical variables (mostly binary variables), as this affected the final result.

Figure 2: Lampung Tengah District Beta Model, Actual and Predicted Plots



The evaluation of beta models could take advantage of the appropriate fit of statistics such as Adjusted-R2. Furthermore, the assessment could also be conducted by observing the graphic plot display. For instance, in the chart above, the plot of actual observations and the model's predicted results are around the 45-degree line. It indicated that the estimation results in the initial stage were quite good.

After estimating the beta model, the second step was decomposing the error-disturbance of the estimation results at the household and cluster levels (in this model, the cluster referred to the village/ward). The decomposition process aimed to obtain the estimation value of the variance in the household unit and village/ward unit. Table 2 indicates an example of the average error-disturbance display of the beta model for the Lampung Tengah District.

Table 2: The Example of Estimation Error-Disturbance in Lampung Tengah District

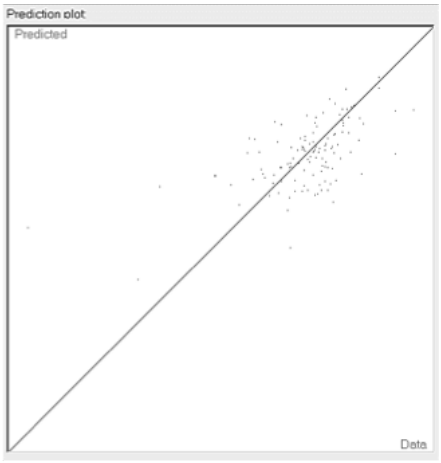
	Cluster ID	#HHLD	Mean	Std.Err.	Min	Median	Max	Weight Sum
1	1012003	4	-1.4406	2.8027	-2.7462	-0.3314	0.7246	2937.4534
2	1014002	5	-0.0674	6.2947	-4.1063	0.2448	2.9049	5169.5596
3	1030004	8	-0.6268	2.2358	-2.8638	-0.3351	1.6616	7779.9237
..	...	...	...	...	...	...	...	..
22	1121006	4	-0.1337	5.8614	-3.8645	0.4763	2.0293	3254.7997

Source: Riskesdas 2013; SP (Sensus Penduduk or Population Census) 2010. Results of the Nutritional Map prepared by the Drafting Team.

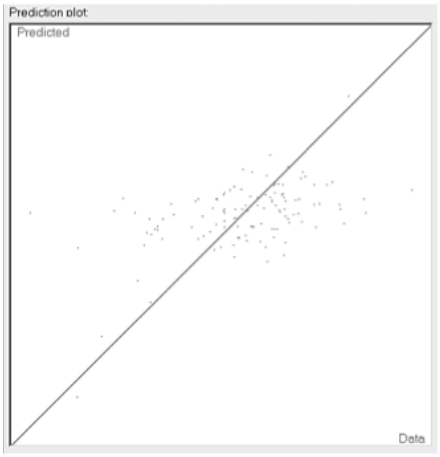
The next estimation process was establishing an alpha model, namely modeling the error-disturbance at the household level. The implication involving the alpha model allowed modeling with a variance that was not constant (experiencing heteroscedasticity). In alpha models, such as ELL (2002 and 2003), the error-disturbance at the household level in the form of a logistic transformation was specified as the dependent variable. Furthermore, the number of household characteristics and cluster-level variables were identified as independent variables.

In the alpha model, selection of the independent variables allowed the consumption prediction variable (yhat) to be used as a candidate. Besides, the interaction between yhat and characteristic variables was also an option to be included in the model. Technically, PovMap provided a stepwise approach to obtain estimation results where all the variables involved were statistically significant. The opportunity to estimate step-by-step allowed the use of both the backward and forward methods. The variance parameter obtained from this alpha model estimation would be used to form the variance-covariance matrix construction in the next GLS model. To evaluate the results, a graphical approach could provide an overview of random patterns in the alpha model prediction. For the alpha model that is still not well-fitted, graphically, there was a line pattern (patterned plot).

Figure 3: Graphic Plot of Alpha Model



a. Pattern Plot



b.Random Pattern Plot

Source: Susenas; SP 2010. PovMap results processed by the 2011 Integrated Database Drafting Team.

After estimating the alpha model, PovMap estimated the consumption model employing the GLS approach. It implied that the construction of the variance-covariance matrix in this GLS estimation had taken into account the estimated variance of household units and cluster units at the village/ward level. The implication was that the heteroscedasticity problem experienced by the early consumption model (beta model) could be overcome or corrected. The next implication was that the estimation results on the variance parameter could be utilised for bootstrap simulation. Estimation of the parameter coefficient on each household characteristic variable formed the parameter that would be used for the simulation.

The bootstrap simulation was the final stage to obtain an estimation of the extent of malnutrition or stunting among children under-five in the desired regional unit or cluster. In this context, the percentage estimation of individual children under-five in the village/ward unit which is in the regency/municipal z-score (weight/age index, height/age index, and weight/height index). The essential data or information to conduct simulations included the malnutrition rate or the stunting rate at the regency/municipal level. Technically, the bootstrap process was repeatedly carried out to predict the z-score value of children under-five through population census data (the process was carried out in 100 repetitions by default).

To every prediction of the weight/age, the height/age, and the weight/height index in each child under-five, confirmation was required whether the prediction value was above or below the weight/age, height/age, and weight/height index. The confirmation process was carried out by providing a value; if it were smaller than the weight/age index, height/age index, and weight/height index, it would be categorised as one. If the value was greater than the weight/age index, it would be classified as zero. After 100 replications, the number of times or how many proportions of the household in question would be counted below the weight/age index, height/age index, and weight/height index. Furthermore, a predictive simulation number or probability value of malnutrition would be obtained from each household. The aggregated value for each child under-five was calculated at the village/ward level so that an estimation of the number of malnourished children under-five at the subdistrict and regency/municipality levels was obtained. Appendix A reveals the examples of estimation results for the five districts at the subdistrict and village/ward levels.

Early Stage Development: The Map of Nutritional Status of Children Under-Five in Five Districts

In 2018, TNP2K initiated the development of the nutritional status map of children under-five in five districts/cities as a prototype for a more comprehensive mapping of the nutritional status of children under-five and stunting prevalence. In the early stages, development of the map was focused on five districts that were included in the 100 priority districts/cities for stunting prevention–Lampung Tengah, Tasikmalaya, Pemalang, Jember, and Timor Tengah Selatan. Table 3 indicates that these five districts are the districts with a prevalence of stunting among children under-five and a poverty rate that is higher than the national rate.

Table 3: Stunting Prevalence and Poverty Rates

District	Stunting Prevalence (2013) (%)	Number of Stunted Children Under-Five (2013) (headcount)	Poverty Rate (March 2018) (%)	Total Number of Villages
Lampung Tengah	52.68	59,838	13.28	307
Tasikmalaya	41.73	69,401	11.24	351
Pemalang	46.28	57,370	17.58	222
Jember	44.10	80,359	10.97	248
Timor Tengah Selatan	70.43	38,773	29.89	278
National	**37.21**		**9.82**	**74,957**

Source: Susenas 2018 and Basic Health Research (Riskesdas) 2013 (processed).

An essential step in the preparation of nutrition maps for five selected districts was the model validation testing by comparing the prevalence values generated by the SAE approach and field findings obtained from direct field surveys (*field verification*). The verification process was conducted with anthropometric surveys and interviews in three sample villages in each selected district. The survey collected directly the data of children aged 0-59 months in the sample villages. The data collected included not only anthropometric information but also the characteristics of households and household members.

The data from the primary survey results in the sample villages would then be compared with the estimation results using the SAE approach. The confidence interval measure was used as the basis for assessing whether the numbers generated were the same between the SAE approach and the field survey. The comparison of these two numbers produced three possibilities–*matched*, *inconclusive*, and *not matched*.

Policy Contribution

The development of a map of nutritional status and stunting prevalence among children under-five was very dependent on the support of, and coordination between, related institutions. The Health Research and Development Unit (Ministry of Health) and Statistics Indonesia played an essential role in providing access to data on Basic Health Research, Population Census, Susenas, Podes, and other relevant survey data used in the development of the nutritional status map.

Although the coverage area of this map was still limited to five districts, it is expected that this nutritional status map can be developed comprehensively–starting from priority districts for handling stunting to one covering all districts/cities. The development of the map of nutritional status and stunting prevalence was expected to contribute to improving the targeting system of priority policies to reduce stunting as follows:

1. It is expected that the nutritional status map can function as a reliable data baseline that can capture the condition of children under-five and household characteristics before the start of specific interventions based on the Five Pillars of Stunting Prevention;
2. It is expected that the nutritional status map can function as a planning guide for regional governments, at regency/municipality, subdistrict, and ward/village levels to allocate resources to priority areas; and
3. It is expected that the nutritional status map can help the process of monitoring and evaluating the impact of stunting prevention programs to identify the most effective programs for stunting prevention.

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Appendix One: Supplementary Tables

Table 1A.1: Estimation Results with Beta Model in Small Area Estimation: Lampung Tengah District

	Coefficient	Std. Err	t	|Prob|>t
Beta Model				
_Intercept	-1.228	2.918	-0.421	0.675
Father's School Education Period	0.149	0.137	1.090	0.279
CV_AYAH_YOS	-0.229	0.345	-0.663	0.509
CV_AYAH_IBU	0.143	0.365	0.391	0.696
DWATER1_1	-1.099	1.500	-0.732	0.466
DWATER2_1	-0.660	0.915	-0.721	0.473
FDISPOSAL2_1	-0.966	0.952	-1.015	0.313
Mother's School Education Period	-0.011	0.153	-0.074	0.941
TOILET1_1	-0.318	1.436	-0.222	0.825
TOILET2_1	-0.923	1.763	-0.523	0.602
Age of Children Under-Five	-0.028	0.017	-1.626	0.108
Father's Age	0.093	0.076	1.227	0.223
Mother's Age	-0.091	0.091	-1.003	0.319
R-squared: 0,1149407, Adj.R-squared: -0,0085559409, Obs: 99				

Source: *Riskesdas* 2013, SP 2010. Results of the Nutritional Map prepared by the Drafting Team.

Table 1A.2: Estimation Results with Alpha Model in Small Area Estimation: Lampung Tengah District

	Coefficient	Std. Err	t	|Prob|>t
Alpha Model				
intercept	-6.785	1.313	-5.166	0.000
yhat	-2.961	1.207	-2.452	0.016
_yhat_*_yhat_	-0.448	0.246	-1.823	0.071
Age of Children Under-Five	-0.019	0.014	-1.379	0.171
R-squared: 0,11716618, Adj.R-squared: 0,08928722, Obs: 99				

Source: *Riskesdas* 2013, SP 2010. Results of the Nutritional Map prepared by the Drafting Team.

Table 1A.3: Estimation Results with the GLS Model in Small Area Estimation (SAE Nutritional Map-ELL) in Lampung Tengah

	Coefficient	Std. Err	t	|Prob|>t
GLS				
Intercept	12.7545	0.1951	65.3855	0.0000
H_ACCINTERNET_1	0.1137	0.0640	1.7756	0.0765
H_CELLPHONE_1	0.1805	0.0345	5.2299	0.0000
H_FCOOK_1	0.2656	0.0627	4.2391	0.0000
H_HHIND_1	0.1423	0.0849	1.6771	0.0942
H_HHMALE_1	0.1427	0.0410	3.4826	0.0005
H_HHSERV_1	0.1503	0.0447	3.3631	0.0008
H_HOUSE1_1	-0.0672	0.0512	-1.3111	0.1905
H_HOUSE2_1	-0.1616	0.0773	-2.0909	0.0371
H_NCHILDSD	-0.1025	0.0130	-7.8975	0.0000
H_NCHILDSMA	-0.0915	0.0188	-4.8742	0.0000
H_NCHILDSMP	-0.0856	0.0182	-4.6976	0.0000
H_PCFLOOR	0.0091	0.0017	5.2446	0.0000
H_SHHMEMPLOY	0.2299	0.0680	3.3808	0.0008
H_TFLOOR_1	0.1356	0.0444	3.0521	0.0024
H_TOILET1_1	0.1252	0.0428	2.9228	0.0036
PDS_APOTEK_1	-0.2091	0.2331	-0.8968	0.3703
PDS_DOCTOR_1	-0.2630	0.1135	-2.3167	0.0210
PDS_HHAGR	-0.0034	0.0019	-1.8074	0.0714

Source: *Riskesdas* 2013, SP 2010. Results of the Nutritional Map prepared by Drafting Team.

Table 1A.4: Nutritional Map Estimation Results at the District Level: Lampung Tengah District

Code	Name of District/ Subdistrict	Number of Children Under-Five (headcount)	Estimated Number of Stunted Children Under-Five (headcount)	Prevalence of Stunting in Children Under-Five (%)
	DISTRICT			
1805	Lampung Tengah District	108,491	56,762	52.32
(Target of Povmap percentage rate = 52.68 percent)				
	SUBDISTRICT			
1805010	Padang Ratu	4,520	2,530	55.97
1805011	Selagai Lingga	3,064	1,676	54.70
1805012	Pubian	4,063	2,085	51.32
1805013	Anak Tuha	3,352	1,827	54.51
1805014	Anak Ratu Aji	1,483	835	56.31
1805020	Kalirejo	5,731	2,860	49.91
1805021	Sendang Agung	3,491	1,641	47.00
1805030	Bangunrejo	5,127	2,599	50.69
1805040	Gunung Sugih	5,801	2,970	51.19
1805041	Bekri	2,281	1,171	51.34
1805042	Bumi Ratu Nuban	2,452	1,315	53.65
1805050	Trimurjo	4,239	2,021	47.68
1805060	Punggur	3,196	1,598	49.99
1805061	Gajah City	2,676	1,186	44.32
1805070	Seputih Raman	3,819	1,930	50.54
1805080	Terbanggi Besar	10,395	5,028	48.37
1805081	Seputih Agung	4,153	2,162	52.05
1805082	Way Pengubuan	3,825	1,942	50.76
1805090	Terusan Nunyai	4,518	2,440	54.00
1805100	Seputih Mataram	4,001	2,293	57.31
1805101	Bandar Mataram	7,045	4,060	57.63
1805110	Seputih Banyak	3,408	1,926	56.51
1805111	Way Seputih	1,486	813	54.70
1805120	Rumbia	2,928	1,589	54.26
1805121	Bumi Nabung	2,547	1,454	57.10
1805122	Putra Rumbia	1,663	953	57.31
1805130	Seputih Surabaya	4,037	2,226	55.13
1805131	Bandar Surabaya	3,190	1,628	51.05

Source: *Riskesdas* 2013, SP 2010. Results of the Nutritional Map prepared by Drafting Team.

Table 1A.5: Nutritional Map Estimation Results at the Village/Ward Level: Lampung Tengah District

Code	Name of District/ Subdistrict	Number of Children Under-Five (headcount)	Estimated Number of Stunted Children Under-Five (headcount)	Prevalence of Stunting in Children Under-Five (%)
	SUBDISTRICT			
1805010	Padang Ratu	4,520	2,530	55.97
	VILLAGE/WARD			
1805010006	Purwosari	263	147	55.89
1805010008	Mojokerto	271	145	53.50
1805010009	Sendang Ayu	446	258	57.84
1805010010	Surabaya	305	181	59.34
1805010011	Bandarsari	482	262	54.35
1805010012	Sri Agung	255	130	50.98
1805010013	Kota Baru	310	169	54.51
1805010014	Margorejo	389	242	62.21
1805010015	Karang Tanjung	220	138	62.73
1805010028	Kuripan	420	231	55.04
1805010029	Haduyang Ratu	302	182	60.26
1805010030	Padang Ratu	287	144	50.17
1805010051	Karang Sari	205	113	55.12
1805010061	Sumbersari	105	64	60.96
1805010062	Purworejo	260	122	46.92

Source: *Riskesdas* 2013, SP 2010. Results of the Nutritional Map prepared by Drafting Team.

Table 1A.6: Estimation Results with Beta Model in Small Area Estimation: Tasikmalaya District

	Coefficient	Std. Err	t	|Prob|>t
Beta Model				
_Intercept	-1.945	2.145	-0.907	0.366
Father's School Education Period	-0.048	0.043	-1.111	0.268
BBAKAR_LISTRIK_1	-0.785	0.616	-1.275	0.204
CV_AYAH_SLTP	-0.820	0.842	-0.973	0.332
CV_IBU_SD	0.864	0.766	1.128	0.261
CV_IBU_YOS	0.267	0.146	1.830	0.069
Mother's School Education Period	-0.031	0.059	-0.526	0.600
JMLANAK_06	1.479	0.792	1.867	0.064
JMLANAK_10	2.919	1.845	1.582	0.115
TOILET1_1	0.995	1.399	0.711	0.478
TOILET2_1	0.972	1.410	0.689	0.492
Age of Children Under-Five	-0.018	0.009	-2.067	0.040
Father's Age	-0.070	0.034	-2.081	0.039
Mother's Age	0.034	0.032	1.075	0.284
R-squared: 0,15097465, Adj.R-squared: -0,0085559409, Obs: 189				

Source: *Riskesdas* 2013, SP 2010. Results of the Nutritional Map prepared by the Drafting Team.
Note: R-squared: 0,15097465, Adj.R-squared: -0,0085559409, Obs: 189

Table 1A.7: Estimation Results with Alpha Model in Small Area Estimation: Tasikmalaya District

	Coefficient	Std. Err	t	|Prob|>t
Alpha Model				
intercept	-4.863	1.409	-3.451	0.001
yhat	7.696	4.950	1.555	0.122
_yhat_*_yhat_	3.765	2.286	1.647	0.101
AYAH_YOS	0.001	0.138	0.007	0.995
AYAH_YOS*_yhat_	-0.087	0.195	-0.446	0.656
AYAH_YOS*_yhat_*_yhat_	-0.052	0.080	-0.641	0.523
BBAKAR_LISTRIK_1	-0.473	0.837	-0.565	0.573
CV_AYAH_SLTP	-0.755	1.131	-0.668	0.505
CV_AYAH_YOS*_yhat_*_yhat_	0.018	0.047	0.385	0.700
CV_IBU_YOS*_yhat_*_yhat_	0.010	0.055	0.173	0.863
IBU_YOS*_yhat_	0.180	0.146	1.237	0.218
IBU_YOS*_yhat_*_yhat_	0.071	0.076	0.940	0.348
JMLANAK_00	-0.876	1.117	-0.784	0.434
JMLANAK_10	-7.372	3.621	-2.036	0.043
TOILET1_1*_yhat_	-9.578	4.588	-2.087	0.038
TOILET1_1*_yhat_*_yhat_	-4.188	2.122	-1.973	0.050
TOILET2_1*_yhat_	-8.918	4.588	-1.944	0.054
TOILET2_1*_yhat_*_yhat_	-3.769	2.123	-1.775	0.078
UMURBALITA	0.059	0.049	1.202	0.231
UMURBALITA*_yhat_	0.033	0.063	0.531	0.596
UMURBALITA*_yhat_*_yhat_	-0.005	0.021	-0.220	0.826
R-squared: 0,22480814, Adj.R-squared: 0,1325234, Obs: 189				

Source: *Riskesdas* 2013, SP 2010. Results of the Nutritional Map prepared by the Drafting Team.

Table 1A.8: Estimation Results with the GLS Model in Small Area Estimation: Tasikmalaya District

	Coefficient	Std. Err	t	|Prob|>t
GLS				
Intercept	12.7545	0.1951	65.3855	0.0000
H_ACCINTERNET_1	0.1137	0.0640	1.7756	0.0765
H_CELLPHONE_1	0.1805	0.0345	5.2299	0.0000
H_FCOOK_1	0.2656	0.0627	4.2391	0.0000
H_HHIND_1	0.1423	0.0849	1.6771	0.0942
H_HHMALE_1	0.1427	0.0410	3.4826	0.0005
H_HHSERV_1	0.1503	0.0447	3.3631	0.0008
H_HOUSE1_1	-0.0672	0.0512	-1.3111	0.1905
H_HOUSE2_1	-0.1616	0.0773	-2.0909	0.0371
H_NCHILDSD	-0.1025	0.0130	-7.8975	0.0000
H_NCHILDSMA	-0.0915	0.0188	-4.8742	0.0000
H_NCHILDSMP	-0.0856	0.0182	-4.6976	0.0000
H_PCFLOOR	0.0091	0.0017	5.2446	0.0000
H_SHHMEMPLOY	0.2299	0.0680	3.3808	0.0008
H_TFLOOR_1	0.1356	0.0444	3.0521	0.0024
H_TOILET1_1	0.1252	0.0428	2.9228	0.0036
PDS_APOTEK_1	-0.2091	0.2331	-0.8968	0.3703
PDS_DOCTOR_1	-0.2630	0.1135	-2.3167	0.0210
PDS_HHAGR	-0.0034	0.0019	-1.8074	0.0714

Source: *Riskesdas* 2013, SP 2010. Results of the Nutritional Map prepared by Drafting Team.

Table 1A.9: Nutritional Map Estimation Results at the District Level: Tasikmalaya District

Code	Name of District/ Subdistrict	Number of Children Under-Five (headcount)	Estimated Number of Stunted Children Under-Five (headcount)	Prevalence of Stunting in Children Under-Five (%)
	DISTRICT			
3206	Tasikmalaya	151,301	60,732	40.14
(Target of Povmap percentage rate = 41.73 percent)				
	SUBDISTRICT			
3206010	Cipatujah	5,871	2,434	41.45
3206020	Karangnunggal	6,798	2,671	39.29
3206030	Cikalong	5,844	2,453	41.97
3206040	Pancatengah	4,356	1,815	41.66
3206050	Cikatomas	4,174	1,606	38.47
3206060	Cibalong	2,404	936	38.94
3206061	Parungponteng	2,700	1,067	39.52
3206070	Bantarkalong	3,084	1,206	39.11
3206071	Bojongasih	1,660	644	38.80
3206072	Culamega	2,124	834	39.28
3206080	Bojonggambir	3,689	1,727	46.81
3206090	Sodonghilir	5,683	2,402	42.27
3206100	Taraju	3,560	1,557	43.74
3206110	Salawu	4,844	2,220	45.84
3206111	Puspahiang	2,729	1,219	44.67
3206120	Tanjungjaya	3,848	1,515	39.38
3206130	Sukaraja	4,419	1,670	37.80
3206140	Salopa	4,907	1,935	39.44
3206141	Jatiwaras	4,507	1,811	40.18
3206150	Cineam	2,240	861	38.43
3206151	Karangjaya	886	367	41.42
3206160	Manonjaya	5,125	1,970	38.43
3206161	Gunungtanjung	2,590	1,040	40.17
3206190	Singaparna	5,965	2,241	37.57
3206191	Sukarame	3,403	1,270	37.31
3206192	Mangunreja	3,350	1,292	38.58

Code	Name of District/ Subdistrict	Number of Children Under-Five (headcount)	Estimated Number of Stunted Children Under-Five (headcount)	Prevalence of Stunting in Children Under-Five (%)
	SUBDISTRICT			
3206200	Cigalontang	5,942	2,610	43.92
3206210	Leuwisari	3,337	1,310	39.26
3206211	Sariwangi	2,739	1,111	40.55
3206212	Padakembang	3,354	1,274	37.98
3206221	Sukaratu	4,116	1,572	38.19
3206230	Cisayong	4,362	1,743	39.95
3206231	Sukahening	2,418	917	37.94
3206240	Rajapolah	4,235	1,569	37.06
3206250	Jamanis	3,018	1,220	40.44
3206260	Ciawi	5,321	2,040	38.33
3206261	Kadipaten	3,514	1,431	40.71
3206270	Pagerageung	4,909	1,911	38.92
3206271	Sukaresik	3,276	1,254	38.29

Source: *Riskesdas* 2013, SP 2010. Results of the Nutritional Map prepared by Drafting Team.

Table 1A.10: Nutritional Map Estimation Results at the Village/Ward Level: Tasikmalaya District

Code	Name of District/ Subdistrict	Number of Children Under-Five (headcount)	Estimated Number of Stunted Children Under-Five (headcount)	Prevalence of Stunting in Children Under-Five (%)
	DISTRICT			
3206010	Cipatujah	5,871	2,434	41.45
	VILLAGE/WARD			
3206010001	Ciheras	526	240	45.63
3206010002	Cipanas	329	155	47.11
3206010003	Ciandum	486	203	41.77
3206010004	Cipatujah	480	178	37.08
3206010005	Sindangkerta	584	225	38.54
3206010006	Cikawungading	692	297	42.92
3206010007	Kertasari	394	166	42.13
3206010008	Padawaras	217	89	41.01
3206010009	Darawati	259	117	45.17
3206010010	Bantarkalong	427	164	38.41
3206010011	Tobongjaya	331	130	39.27
3206010012	Nangelasari	245	94	38.37
3206010013	Nagrog	364	173	47.53
3206010014	Pameutingan	304	114	37.54
3206010015	Sukahurip	233	86	36.91

Source: *Riskesdas* 2013, SP 2010. Results of the Nutritional Map prepared by Drafting Team.

Table 1A.11: Estimation Results with Beta Model in Small Area Estimation: Pemalang District

	Coefficient	Std. Err	t	|Prob|>t
Beta Model				
intercept	-1.558	1.755	-0.888	0.376
AYAH_SLTA_1	0.894	0.903	0.990	0.324
AYAH_SLTP_1	0.620	0.678	0.915	0.362
AYAH_YOS	-0.040	0.064	-0.624	0.533
BALITA_LAKI2_1	-0.366	0.382	-0.958	0.339
CV_AYAH_YOS	-0.112	0.119	-0.946	0.346
CV_IBU_SD	-0.676	0.874	-0.774	0.440
DWATER2_1	0.371	0.438	0.847	0.399
FDISPOSAL1_1	0.488	0.504	0.969	0.334
IBU_YOS	0.005	0.059	0.082	0.935
LANTAI_UBIN_1	-0.834	0.461	-1.809	0.073
TOILET1_1	0.570	0.612	0.931	0.353
TOILET2_1	-0.233	0.798	-0.292	0.771
UMURBALITA	-0.009	0.010	-0.825	0.411
UMUR_AYAH	0.028	0.036	0.789	0.431
R-squared: 0,10842519, Adj.R-squared: 0,022342109, Obs: 160				

Source: *Riskesdas* 2013, SP 2010. Results of the Nutritional Map prepared by the Drafting Team.

Table 1A.12: Estimation Results with Alpha Model in Small Area Estimation: Pemalang District

	Coefficient	Std. Err	t	|Prob|>t
Alpha Model				
intercept	0.804	12.638	0.064	0.949
yhat	9.578	14.194	0.675	0.501
_yhat_*_yhat_	3.332	3.947	0.844	0.400
AYAH_SLTA_1	15.127	8.956	1.689	0.094
AYAH_SLTA_1*_yhat_	18.494	12.622	1.465	0.145
AYAH_SLTA_1*_yhat_*_yhat_	6.015	4.619	1.302	0.195
AYAH_SLTP_1	6.990	5.450	1.283	0.202
AYAH_SLTP_1*_yhat_	4.435	6.927	0.640	0.523
AYAH_SLTP_1*_yhat_*_yhat_	0.657	2.213	0.297	0.767
AYAH_YOS	-0.777	0.539	-1.443	0.152
AYAH_YOS*_yhat_	-0.686	0.576	-1.191	0.236
AYAH_YOS*_yhat_*_yhat_	-0.126	0.153	-0.823	0.412
BALITA_LAKI2_1	-6.315	3.015	-2.095	0.038
BALITA_LAKI2_1*_yhat_	-5.756	3.490	-1.649	0.102
BALITA_LAKI2_1*_yhat_*_yhat_	-1.190	1.002	-1.187	0.238
DWATER2_1	1.346	3.921	0.343	0.732
DWATER2_1*_yhat_	2.442	4.411	0.554	0.581
DWATER2_1*_yhat_*_yhat_	1.170	1.232	0.950	0.344
FDISPOSAL1_1	-2.325	2.746	-0.847	0.399
FDISPOSAL1_1*_yhat_	-6.941	3.798	-1.827	0.070
FDISPOSAL1_1*_yhat_*_yhat_	-2.886	1.285	-2.246	0.027
IBU_YOS	-0.135	0.275	-0.493	0.623
IBU_YOS*_yhat_	-0.511	0.393	-1.299	0.196
IBU_YOS*_yhat_*_yhat_	-0.214	0.134	-1.588	0.115
LANTAI_UBIN_1	-0.215	3.034	-0.071	0.944
LANTAI_UBIN_1*_yhat_	3.024	3.767	0.803	0.424
LANTAI_UBIN_1*_yhat_*_yhat_	1.025	1.226	0.836	0.405
TOILET1_1	-1.504	6.763	-0.222	0.824

	Coefficient	Std. Err	t	|Prob|>t
TOILET1_1*_yhat_	-1.672	7.037	-0.238	0.813
TOILET1_1*_yhat_*_yhat_	-0.165	1.820	-0.091	0.928
TOILET2_1	4.992	8.767	0.569	0.570
TOILET2_1*_yhat_	5.192	9.834	0.528	0.598
TOILET2_1*_yhat_*_yhat_	1.810	2.586	0.700	0.485
UMURBALITA	-0.092	0.067	-1.370	0.173
UMURBALITA*_yhat_	-0.075	0.088	-0.846	0.399
UMURBALITA*_yhat_*_yhat_	-0.022	0.027	-0.794	0.429
UMUR_AYAH	-0.003	0.243	-0.013	0.990
UMUR_AYAH*_yhat_	-0.122	0.296	-0.412	0.681
UMUR_AYAH*_yhat_*_yhat_	-0.053	0.090	-0.592	0.555
R-squared: 0.34137871, Adj.R-squared: 0.13453897, Obs: 160				

Source: *Riskesdas* 2013, SP 2010. Results of the Nutritional Map prepared by the Drafting Team.

Table 1A.13: Estimation Results with the GLS Model in Small Area Estimation: Pemalang District

	Coefficient	Std. Err	t	|Prob|>t
GLS				
Intercept	12.7545	0.1951	65.3855	0.0000
H_ACCINTERNET_1	0.1137	0.0640	1.7756	0.0765
H_CELLPHONE_1	0.1805	0.0345	5.2299	0.0000
H_FCOOK_1	0.2656	0.0627	4.2391	0.0000
H_HHIND_1	0.1423	0.0849	1.6771	0.0942
H_HHMALE_1	0.1427	0.0410	3.4826	0.0005
H_HHSERV_1	0.1503	0.0447	3.3631	0.0008
H_HOUSE1_1	-0.0672	0.0512	-1.3111	0.1905
H_HOUSE2_1	-0.1616	0.0773	-2.0909	0.0371
H_NCHILDSD	-0.1025	0.0130	-7.8975	0.0000
H_NCHILDSMA	-0.0915	0.0188	-4.8742	0.0000
H_NCHILDSMP	-0.0856	0.0182	-4.6976	0.0000
H_PCFLOOR	0.0091	0.0017	5.2446	0.0000
H_SHHMEMPLOY	0.2299	0.0680	3.3808	0.0008
H_TFLOOR_1	0.1356	0.0444	3.0521	0.0024
H_TOILET1_1	0.1252	0.0428	2.9228	0.0036
PDS_APOTEK_1	-0.2091	0.2331	-0.8968	0.3703
PDS_DOCTOR_1	-0.2630	0.1135	-2.3167	0.0210
PDS_HHAGR	-0.0034	0.0019	-1.8074	0.0714

Source: *Riskesdas* 2013, SP 2010. Results of the Nutritional Map prepared by Drafting Team.

Table 1A.14: Nutritional Map Estimation Results at the Subdistrict Level: Pemalang District

Code	Name of District/ Subdistrict	Number of Children Under-Five (headcount)	Estimated Number of Stunted Children Under-Five (headcount)	Prevalence of Stunting in Children Under-Five (%)
	DISTRICT			
3327	Pemalang District	112,320	52,341	46.60
(Target of Povmap percentage rate = 46.28 percent)				
	SUBDISTRICT			
3327010	Moga	5,992	2,810	46.90
3327011	Moga	3,472	1,513	43.57
3327020	Pulosari	4,871	2,480	50.92
3327030	Belik	9,770	4,743	48.55
3327040	Watukumpul	6,378	2,975	46.65
3327050	Bodeh	4,462	2,181	48.88
3327060	Bantarbolang	6,085	2,483	40.80
3327070	Randudongkal	7,829	3,453	44.11
3327080	Pemalang District	14,899	7,132	47.87
3327090	Taman	14,074	6,484	46.07
3327100	Petarukan	12,580	5,896	46.87
3327110	Ampelgading	5,622	2,632	46.81
3327120	Comal	7,401	3,292	44.48
3327130	Ulujami	8,885	4,265	48.00

Source: *Riskesdas* 2013, SP 2010. Results of the Nutritional Map prepared by the Drafting Team.

Table 1A.15: Nutritional Map Estimation Results at the Village/Ward Level: Pemalang District

Code	Name of District/ Subdistrict	Number of Children Under-Five (headcount)	Estimated Number of Stunted Children Under-Five (headcount)	Prevalence of Stunting in Children Under-Five (%)
	SUBDISTRICT			
3327010	Moga	5,992	2,810	46.90
	VILLAGE/WARD			
3327010001	Plakaran	363	146	40.22
3327010002	Mandiraja	534	233	43.63
3327010003	Walangsanga	636	317	49.85
3327010004	Sima	1,004	475	47.31
3327010005	Banyumudal	1,528	725	47.43
3327010006	Moga	753	337	44.75
3327010007	Wangkelang	212	117	55.19
3327010008	Kebanggan	156	70	44.87
3327010009	Pepedan	143	90	63.93
3327010010	Gendowang	663	301	45.40

Source: *Riskesdas* 2013, SP 2010. Results of the Nutritional Map prepared by the Drafting Team.

Table 1A.16: Estimation Results with Beta Model in Small Area Estimation: Jember District

	Coefficient	Std. Err	t	|Prob|>t
Beta Model				
intercept	-1.113	0.983	-1.131	0.259
AYAH_PT_1	-0.662	1.239	-0.534	0.594
AYAH_SD_1	-0.546	0.432	-1.265	0.207
AYAH_SLTA_1	-0.598	0.915	-0.654	0.514
AYAH_SLTP_1	0.450	0.701	0.642	0.522
AYAH_TDKSEKOLAH_1	0.791	0.717	1.103	0.271
AYAH_YOS	0.036	0.070	0.505	0.614
BBAKAR_GAS_1	0.294	0.267	1.099	0.273
CV_AYAH_SD	1.232	0.643	1.916	0.056
CV_AYAH_TDKSEKOLAH	0.681	1.307	0.521	0.603
CV_AYAH_YOS	0.095	0.082	1.167	0.244
CV_IBU_SD	-1.584	0.711	-2.226	0.027
CV_IBU_YOS	-0.118	0.093	-1.279	0.202
DWATER1_1	0.822	0.301	2.735	0.007
IBU_PT_1	1.148	0.715	1.605	0.110
IBU_SLTA_1	0.161	0.480	0.336	0.737
IBU_TDKSEKOLAH_1	-0.951	0.698	-1.361	0.175
IBU_YOS	-0.036	0.047	-0.777	0.438
UMURBALITA	-0.017	0.006	-2.835	0.005
UMUR_IBU	0.014	0.017	0.803	0.423
R-squared: 0.17898775, Adj.R-squared: 0.11781428, Obs: 275				

Source: *Riskesdas* 2013, SP 2010. Results of the Nutritional Map prepared by the Drafting Team.

Table 1A.17: Estimation Results with Alpha Model in Small Area Estimation: Jember District

	Coefficient	Std. Err	t	|Prob|>t
Alpha Model				
intercept	-3.570	0.594	-6.012	0.000
yhat	1.134	0.787	1.441	0.151
_yhat_*_yhat_	0.366	0.252	1.450	0.148
R-squared: 0.17898775, Adj.R-squared: 0.11781428, Obs: 275				

Source: *Riskesdas* 2013, SP 2010. Results of the Nutritional Map prepared by the Drafting Team.

Table 1A.18: Estimation Results with the GLS Model in Small Area Estimation: Jember District

	Coefficient	Std. Err	t	|Prob|>t
GLS				
Intercept	12.7545	0.1951	65.3855	0.0000
H_ACCINTERNET_1	0.1137	0.0640	1.7756	0.0765
H_CELLPHONE_1	0.1805	0.0345	5.2299	0.0000
H_FCOOK_1	0.2656	0.0627	4.2391	0.0000
H_HHIND_1	0.1423	0.0849	1.6771	0.0942
H_HHMALE_1	0.1427	0.0410	3.4826	0.0005
H_HHSERV_1	0.1503	0.0447	3.3631	0.0008
H_HOUSE1_1	-0.0672	0.0512	-1.3111	0.1905
H_HOUSE2_1	-0.1616	0.0773	-2.0909	0.0371
H_NCHILDSD	-0.1025	0.0130	-7.8975	0.0000
H_NCHILDSMA	-0.0915	0.0188	-4.8742	0.0000
H_NCHILDSMP	-0.0856	0.0182	-4.6976	0.0000
H_PCFLOOR	0.0091	0.0017	5.2446	0.0000
H_SHHMEMPLOY	0.2299	0.0680	3.3808	0.0008
H_TFLOOR_1	0.1356	0.0444	3.0521	0.0024
H_TOILET1_1	0.1252	0.0428	2.9228	0.0036
PDS_APOTEK_1	-0.2091	0.2331	-0.8968	0.3703
PDS_DOCTOR_1	-0.2630	0.1135	-2.3167	0.0210
PDS_HHAGR	-0.0034	0.0019	-1.8074	0.0714

Source: *Riskesdas* 2013, SP 2010. Results of the Nutritional Map prepared by Drafting Team.

Table 1A.19: Nutritional Map Estimation Results at the Subdistrict Level: Jember District

Code	Name of District/ Subdistrict	Number of Children Under-Five (headcount)	Estimated Number of Stunted Children Under-Five (headcount)	Prevalence of Stunting in Children Under-Five (%)
	DISTRICT			
3509	Jember	176,858	76,067	43.01
(Target of Povmap percentage rate = 44.10 percent)				
	SUBDISTRICT			
3509010	Kencong	4,390	1,826	41.60
3509020	Gumuk Mas	5,566	2,590	46.54
3509030	Puger	8,807	3,612	41.01
3509040	Wuluhan	8,411	3,734	44.39
3509050	Ambulu	7,503	3,220	42.92
3509060	Tempurejo	5,424	2,441	45.00
3509070	Silo	8,392	3,849	45.86
3509080	Mayang	3,646	1,706	46.79
3509090	Mumbulsari	4,870	2,329	47.82
3509100	Jenggawah	6,078	2,792	45.93
3509110	Ajung	5,775	2,649	45.87
3509120	Rambipuji	5,940	2,564	43.17
3509130	Balung	5,532	2,159	39.02
3509140	Umbulsari	5,112	2,211	43.26
3509150	Semboro	3,301	1,318	39.93
3509160	Jombang	3,539	1,523	43.04
3509170	Sumber Baru	8,103	3,318	40.95
3509180	Tanggul	6,551	2,518	38.43
3509190	Bangsalsari	8,685	3,975	45.77
3509200	Panti	4,694	2,119	45.15
3509210	Sukorambi	2,992	1,417	47.36
3509220	Arjasa	2,986	1,287	43.09
3509230	Pakusari	3,311	1,545	46.65
3509240	Kalisat	5,609	2,711	48.33

Code	Name of District/ Subdistrict	Number of Children Under-Five (headcount)	Estimated Number of Stunted Children Under-Five (headcount)	Prevalence of Stunting in Children Under-Five (%)
	SUBDISTRICT			
3509250	Ledokombo	4,853	2,333	48.08
3509260	Sumberjambe	4,678	2,082	44.51
3509270	Sukowono	4,169	2,014	48.31
3509280	Jelbuk	2,503	1,049	41.92
3509710	Kaliwates	9,069	3,034	33.45
3509720	Sumbersari	9,301	3,496	37.59
3509730	Patrang	7,068	2,641	37.37

Source: *Riskesdas* 2013, SP 2010. Results of the Nutritional Map prepared by the Drafting Team.

Table 1A.20: Nutritional Map Estimation Results at the Village/Ward Level: Jember District

Code	Name of District/ Subdistrict	Number of Children Under-Five (headcount)	Estimated Number of Stunted Children Under-Five (headcount)	Prevalence of Stunting in Children Under-Five (%)
	SUBDISTRICT			
3509010	Kencong	4,390	1,826	41.60
	VILLAGE/WARD			
3509010001	Paseban	481	197	40.95
3509010002	Cakru	672	284	42.26
3509010003	Kraton	590	256	43.39
3509010004	Wonorejo	986	390	39.55
3509010005	Kencong	1,661	700	42.14

Source: *Riskesdas* 2013, SP 2010. Results of the Nutritional Map prepared by the Drafting Team.

Table 1A.21: Estimation Results with Beta Model in Small Area Estimation: Timor Tengah Selatan District

	Coefficient	Std. Err	t	|Prob|>t
Beta Model				
intercept	-0.111	1.234	-0.090	0.929
AYAH_YOS	0.041	0.036	1.142	0.255
BALITA_LAKI2_1	-0.555	0.269	-2.060	0.041
CV_AYAH_SD	-0.380	1.345	-0.283	0.778
CV_AYAH_SLTA	-1.439	2.472	-0.582	0.561
CV_AYAH_SLTP	0.782	2.140	0.366	0.715
CV_AYAH_YOS	-0.120	0.177	-0.677	0.499
CV_IBU_SD	-1.143	1.278	-0.894	0.372
CV_IBU_SLTA	-3.010	1.735	-1.734	0.084
CV_IBU_SLTP	-1.651	1.522	-1.085	0.279
CV_IBU_YOS	0.169	0.124	1.365	0.173
DWATER1_1	-0.381	0.672	-0.567	0.571
DWATER2_1	-0.577	0.301	-1.914	0.057
FDISPOSAL1_1	0.074	0.618	0.120	0.905
IBU_YOS	-0.042	0.037	-1.129	0.260
TOILET1_1	-1.271	0.622	-2.044	0.042
TOILET2_1	-0.955	0.810	-1.179	0.240
UMURBALITA	-0.043	0.008	-5.452	0.000
UMUR_IBU	0.058	0.024	2.478	0.014
R-squared: 0.2708789, Adj.R-squared: 0.21430916, Obs: 251				

Source: *Riskesdas* 2013, SP 2010. Results of the Nutritional Map prepared by the Drafting Team.

Table 1A.22: Estimation Results with Alpha Model in Small Area Estimation: Timor Tengah Selatan District

	Coefficient	Std. Err	t	|Prob|>t
Alpha Model				
intercept	-3.701	1.676	-2.208	0.028
yhat	2.208	0.851	2.594	0.010
_yhat_*_yhat_	0.164	0.163	1.009	0.314
AYAH_YOS	-0.132	0.056	-2.348	0.020
BALITA_LAKI2_1	1.358	0.520	2.612	0.010
CV_AYAH_SD	2.955	1.422	2.079	0.039
CV_AYAH_SLTA	7.968	3.518	2.265	0.024
CV_AYAH_SLTP	0.310	2.773	0.112	0.911
CV_AYAH_YOS	-0.129	0.275	-0.468	0.640
CV_IBU_YOS	-0.020	0.138	-0.146	0.884
DWATER1_1	0.512	0.855	0.599	0.550
DWATER2_1	0.292	0.541	0.539	0.590
FDISPOSAL1_1	-0.478	0.913	-0.524	0.601
IBU_YOS	0.037	0.060	0.618	0.537
TOILET1_1	0.763	0.795	0.960	0.338
UMURBALITA	0.038	0.032	1.187	0.236
UMUR_IBU	-0.011	0.055	-0.209	0.835
R-squared: 0.16063379, Adj.R-squared: 0.10324123, Obs: 251				

Source: *Riskesdas* 2013, SP 2010. Results of the Nutritional Map prepared by the Drafting Team.

Table 1A.23: Estimation Results with the GLS Model in Small Area Estimation: Timor Tengah Selatan District

	Coefficient	Std. Err	t	|Prob|>t
GLS				
Intercept	12.7545	0.1951	65.3855	0.0000
H_ACCINTERNET_1	0.1137	0.0640	1.7756	0.0765
H_CELLPHONE_1	0.1805	0.0345	5.2299	0.0000
H_FCOOK_1	0.2656	0.0627	4.2391	0.0000
H_HHIND_1	0.1423	0.0849	1.6771	0.0942
H_HHMALE_1	0.1427	0.0410	3.4826	0.0005
H_HHSERV_1	0.1503	0.0447	3.3631	0.0008
H_HOUSE1_1	-0.0672	0.0512	-1.3111	0.1905
H_HOUSE2_1	-0.1616	0.0773	-2.0909	0.0371
H_NCHILDSD	-0.1025	0.0130	-7.8975	0.0000
H_NCHILDSMA	-0.0915	0.0188	-4.8742	0.0000
H_NCHILDSMP	-0.0856	0.0182	-4.6976	0.0000
H_PCFLOOR	0.0091	0.0017	5.2446	0.0000
H_SHHMEMPLOY	0.2299	0.0680	3.3808	0.0008
H_TFLOOR_1	0.1356	0.0444	3.0521	0.0024
H_TOILET1_1	0.1252	0.0428	2.9228	0.0036
PDS_APOTEK_1	-0.2091	0.2331	-0.8968	0.3703
PDS_DOCTOR_1	-0.2630	0.1135	-2.3167	0.0210
PDS_HHAGR	-0.0034	0.0019	-1.8074	0.0714

Source: *Riskesdas* 2013, SP 2010. Results of the Nutritional Map prepared by Drafting Team.

Table 1A.24: Nutritional Map Estimation Results at the District Level: Timor Tengah Selatan District

Code	Name of District/ Subdistrict	Number of Children Under-Five (headcount)	Estimated Number of Stunted Children Under-Five (headcount)	Prevalence of Stunting in Children Under-Five (%)
	DISTRICT			
5304	Timor Tengah Selatan	58,765	38,650	65.77
(Target of Povmap percentage rate = 70.43 percent)				
	SUBDISTRICT			
5304010	Mollo Utara	3,209	2,076	64.70
5304011	Fatumnasi	878	584	66.51
5304012	Tobu	1,232	853	69.23
5304013	Nunbena	508	369	72.64
5304020	Mollo Selatan	1,890	1,340	70.90
5304021	Polen	1,729	1,109	64.14
5304022	Mollo Barat	1,019	649	63.68
5304023	Mollo Tengah	961	640	66.60
5304030	Kota Soe	4,457	3,367	75.55
5304040	Amanuban Barat	2,957	2,123	71.80
5304041	Batu Putih	1,654	1,068	64.57
5304042	Kuatnana	2,111	1,357	64.29
5304050	Amanuban Selatan	3,555	2,256	63.45
5304051	Noebeba	1,618	1,021	63.09
5304060	Kuanfatu	2,628	1,639	62.35
5304061	Kualin	3,032	1,983	65.39
5304070	Amanuban Tengah	1,880	1,281	68.14
5304071	Kolbano	2,373	1,640	69.10
5304072	Oenino	1,433	880	61.40
5304080	Amanuban Timur	2,248	1,427	63.48
5304081	Fautmolo	1,004	674	67.13
5304082	Fatukopa	658	388	58.97
5304090	Kie	2,949	1,918	65.04
5304091	Kotolin	1,574	1,056	67.09

Code	Name of District/ Subdistrict	Number of Children Under-Five (headcount)	Estimated Number of Stunted Children Under-Five (headcount)	Prevalence of Stunting in Children Under-Five (%)
	SUBDISTRICT			
5304100	Amanatun Selatan	2,248	1,432	63.71
5304101	Boking	1,401	793	56.60
5304102	Nunkolo	1,876	1,168	62.26
5304103	Noebana	591	392	66.33
5304104	Santian	767	458	59.72
5304110	Amanatun Utara	2,182	1,367	62.65
5304111	Toianas	1,721	1,082	62.88
5304112	Kokbaun	422	261	61.85

Source: *Riskesdas* 2013, SP 2010. Results of the Nutritional Map prepared by Drafting Team.

Table 1A.25: Nutritional Map Estimation Results at the Village/Ward Level: Timor Tengah Selatan District

Code	Name of District/ Subdistrict	Number of Children Under-Five (headcount)	Estimated Number of Stunted Children Under-Five (headcount)	Prevalence of Stunting in Children Under-Five (%)
	SUBDISTRICT			
5304010	Mollo Utara	3,209	2,076	64.70
	VILLAGE/WARD			
5304010003	Leloboko	190	110	57.89
5304010004	Nefokoko	236	146	61.86
5304010005	Lelobatan	293	189	64.50
5304010006	Netpala	231	153	66.23
5304010007	Obesi	246	182	73.98
5304010008	Eon Besi	490	348	71.02
5304010009	Bosen	274	153	55.84
5304010010	Sebot	167	96	57.48
5304010011	Ajaobaki	233	167	71.67
5304010012	Bijaepunu	233	142	60.94
5304010014	Halme	83	48	57.83
5304010016	Tunua	215	141	65.58
5304010017	Fatukoto	318	202	63.52

Source: *Riskesdas* 2013, SP 2010. Results of the Nutritional Map prepared by the Drafting Team.

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