Intercensal Brazilian municipality stratificatation updating for health performance evaluation, 2015

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Abstract

Objective: to describe updating of stratification of the Brazilian municipalities in order to evaluate health performance. **Methods:** this was a descriptive and methodological study with stratification of municipalities according to population size and conditions influencing health management, using data from the intercensal period (2015) and showing classification variations compared with the census period (2010); the original data on demographic characteristics, funding capacity and population purchasing power were adjusted for the year 2015 based on a baseline study conducted with census data. **Results:** some 15% of the municipalities were reclassified in the intercensal period, with the main factors of change being the conditions influencing health management. **Conclusion:** the need for intercensal updating of this form of classification was confirmed, given that the socioeconomic conditions of the municipalities vary in the five-year period; Primary Health performance evaluation should consider updated stratifications that include management conditions for the purpose of classification.

Keywords: Health Evaluation; Health Management; Health Planning; Methodology.

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Introduction

Grouping municipalities together according to their similarities is an important stage in public policy definition and evaluation. Population size is frequently used for stratifying Brazilian municipalities in Health-related studies.[1-4] The population's socioeconomic and health status as well as spatial conformation and structuring of health services also influence healthcare management conditions. Therefore, evaluating healthcare performance requires municipalities to be stratified in homogenous groups, taking into consideration not only population size but also the conditions mentioned above and their influence. With this concern in mind, a stratified model of Brazilian municipalities was developed based on data from the 2010 census period, taken here as a baseline study, in order to evaluate health management performance.[5]

Between 2010 and 2015, apart from having two national elections, Brazil underwent a series of denouncements of corruption and a process of economic recession began that affected its municipalities in a non-linear manner. The data used for the stratification referred to above may therefore have been subject to variations over that five-year period, as a result of these political, economic and social changes, thus influencing health management conditions in the municipalities. The assumption that such changes had taken place lead to population recounts and other population-based research being conducted in that time interval, given that estimates may not represent reality over the ten-year period between one census and another.[6-10]

> *Grouping municipalities together according to their similarities is an important stage in public policy definition and evaluation.*

The objective of this study was to describe stratification of the Brazilian municipalities in order to evaluate health performance using data from the intercensal period (2015), presenting classification variations by comparison with the census period (2010).

Methods

This was a methodological descriptive study, with stratification of Brazilian municipalities according to population size and conditions influencing health management, using secondary data available to the public.

Stratification in the base-line study[5] used data from 2010 according to the following stages:

(i)   review of proposals for classifying municipalities and definition of indicator categories;[11-13]

(ii) pre-selection of indicators, taking into consideration the consistency and stability of data on population size, conceptual validity in the literature, availability in a database and disaggregation to the municipal level; and identification of summary indicators ($r>0.7$ with the majority of the other indicators) and complementary indicators ($r<0.7$ with the summary indicators), using the correlation test;

(iii) factor analysis to identify indicators with more weight, comprised of three elements, 'demographic characteristics' (demographic density and urbanization rate), 'funding capacity' (per capita GDP) and 'population's purchasing power' (health insurance coverage and percentage of extreme poverty); and indicator relativization, using a monotonic scale (0-1), where 1 corresponds to the largest value obtained and 0 corresponds to the smallest value obtained;

(iv) sum of the converted indicators;

(v) reduction of the element values to scores of 0, 1 and 2, based on quartile amplitude; and

(vi) sum of the scores of the three elements in order to define the condition that influences management,

- unfavorable influence (up to 2 points);

- regular influence (3 to 4 points) or

- favorable influence (5 to 6 points); and

- association of influencing conditions with population size considered as a specific factor, dividing municipalities into small (less than 25,000 inhabitants), medium (25,000 to 100,000 inhab.) and large municipalities (more than 100,000 inhab.) (Figure 1).

For application of this in the intercensal period, we used the indicators found to have more weight in the factor analysis and updated them for the 2015 baseline year, this being a period coinciding with political variations bearing influence on the contexts of Brazilian municipalities,[6] with adjustment of the origin of the data for some indicators. Demographic density
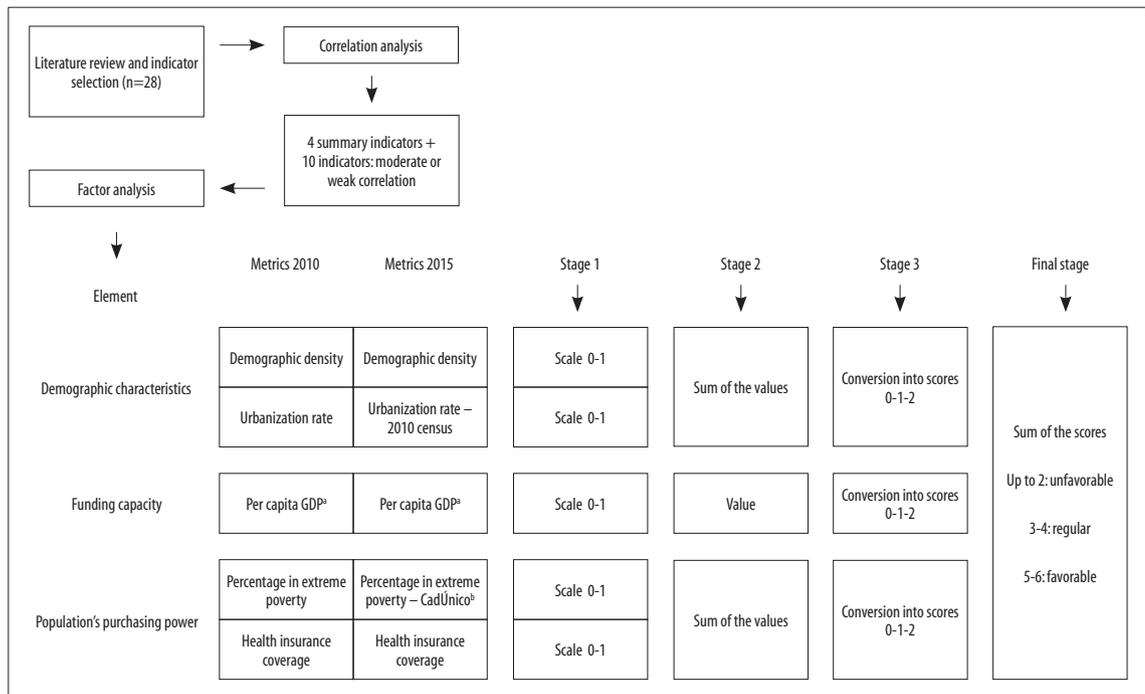
a) GDP: gross domestic product.
b) CadÚnico: Single Social Program Registry.

Figure 1 – Stages used to define local health system management condition, noting that the source of two indicators was changed

used the population projections for the year 2015,[14] whereas the 2010 data was kept for the urbanization rate because there was no updated intercensal data for it, nor was similar information adequate for the study's objective identified. Per capita GDP[8] and health insurance coverage[15] were updated using 2015 data. The Brazilian Institute of Geography and Statistics (IBGE) does not have updated statistics on the percentage of extreme poverty for the year 2015, so we used the Single Social Program Registry (CadÚnico) extreme poverty percentage for 2015 instead,[16] based on Bolsa Família Program data.[17] This is a direct conditional income transfer program the data of which is constantly updated. It is assumed that the number of people registered with the Program represents people in situations of poverty and extreme poverty, by Brazilian municipality.

As such, our intercensal updating of municipality classification included 5,562 of the total of 5,570 Brazilian municipalities. We excluded five municipalities because they only came into existence in 2013, and could therefore not be compared with the classification obtained using 2010 data. A further three municipalities were excluded because they

did not appear on the National Health Agency (ANS) database,[15] and consequently there was no data on health insurance coverage for them.

It should be noted that during the stage in which the indicators were transformed into the monotonic scale, values considered to be outliers were converted into 1, the highest value on the scale, discarding discrepant values for relativization. Analysis was performed using electronic spreadsheets and Epi Info 7™.

Results

The indicators proposed reveal great variability that demarcates the characteristics of each stratum. In 2015, variability is similar to that seen in 2010 (Table 1). In the intercensal period, the vast majority of the municipalities (75.0%) are small and few of them have favorable management (10.4%). The medium-sized municipalities (19.5%) are divided homogenously between the categories of influence on management. With regard to regional distribution, 63.7% of municipalities in the Northeast region are small and have unfavorable influencing conditions; 47% of the large municipalities

Table 1 – Mean values (standard deviation) found in the selected variables, by strata defined by population size and conditions influencing health management, Brazil, 2010 and 2015

Stratum	Number of municipalities		Population (inhab.)		Demographic density (inhab./km²)		Urban households (%)		Per capita GDP[a] (per R$1,000l)		Population in extreme poverty (%)		Population without health insurance (%)	
	2010	2015	2010	2015	2010	2015	2010	2015[b]	2010	2015	2010	2015	2010	2015
Large	283	304	369,034	377,001	1,278.72	1,289.60	94.15	93.41	21.80	31.29	4.71	12.72	72.45	72.24
			(830,645)	(852,018)	(2,194.51)	(2,258.26)	(8.72)	(10.17)	(16.58)	(19.61)	(4.92)	(11.13)	(16.10)	(14.55)
Medium favorable	364	370	50,335	50,464	160.52	164.97	91.18	90.05	24.27	36.54	2.58	7.88	76.98	76.31
			(20,168)	(20,826)	(246.17)	(263.90)	(6.20)	(7.49)	(25.51)	(31.07)	(2.23)	(6.28)	(12.23)	(11.52)
Medium regular	341	378	46,239	46,193	96.06	101.66	75.26	74.79	10.46	17.51	11.49	27.13	93.56	92.79
			(19,794)	(19,478)	(214.14)	(228.76)	(13.13)	(13.62)	(7.43)	(15.20)	(6.50)	(13.35)	(5.11)	(5.35)
Medium unfavorable	298	332	28,278	39,000	38.08	39.17	49.83	49.93	4.85	8.15	30.29	53.37	98.71	98.51
			(12,573)	(14,076)	(47.08)	(47.54)	(14.61)	(15.08)	(2.34)	(3.20)	(8.88)	(11.40)	(1.31)	(1.24)
Small favorable	618	528	11,005	11,309	52.32	57.25	83.27	81.87	23.88	35.11	2.16	8.23	82.13	79.55
			(6,583)	(6,603)	(63.90)	(119.27)	(11.59)	(12.50)	(23.09)	(26.21)	(1.95)	(6.15)	(11.04)	(11.52)
Small regular	1,911	1,832	8,471	8,574	28.05	28.28	65.50	65.53	13.49	21.23	7.32	19.09	94.71	93.18
			(6,009)	(6,007)	(60.68)	(39.68)	(16.17)	(16.50)	(9.90)	(18.10)	(5.95)	(12.94)	(6.21)	(6.78)
Small unfavorable	1,750	1,810	10,191	10,237	29.57	30.81	44.70	45.67	6.06	9.36	25.38	48.02	98.66	98.30
			(5,976)	(5,983)	(33.44)	(35.13)	(16.01)	(16.75)	(3.11)	(4.73)	(11.46)	(18.38)	(2.42)	(3.27)

a) GDP: gross domestic product.
b) Data not collected in intercensal period. 2010 data were replicated.

are located in the Southeast region; and the municipalities of the Midwest, Southeast and Southern regions are concentrated in the small municipality stratum, with regular management conditions, having 61.2%, 40.6% and 47.0%, respectively (Table 2).

Comparison between census and intercensal data stratifications indicated changes in the classification of the municipalities. There were alterations due exclusively to changes in population size in 108 municipalities (1.9%); while in 21 municipalities (0.4%), there were changes both in size and in conditions influencing management. Conditions influencing management, with no change in population size, were responsible for the alteration of the classification of 713 municipalities (12.8%). In all, 842 Brazilian municipalities (15.1%) were reclassified in the analysis period, with regional variations, in particular in the Northern region (20.5%) (Table 3).

Discussion

Organizing the Brazilian municipalities into homogenous groups is an important tool for developing studies on health management performance. The results of the stratifications demonstrated that population size alone is insufficient for achieving this classification, in view of the conditions that influence management in each population size stratum. Demographic, funding and economic aspects are important for characterizing municipalities[18-22] and, along with population size, undergo changes over the years.[6,23,24]

The majority of the Brazilian municipalities are small and classified as having conditions that influence management so that it is regular or unfavorable, with a tendency of (i) lower technical and administrative capacity to ensure adequate management[25] and (ii) a high percentage of inefficiency with regard to health actions and results.[26] These facts reinforce the need to work through regional healthcare networks as an alternative for economy of scale and qualified health actions, ensuring better access and quality in the delivery of these services to the population.[21]

Comparison between the classification of intercensal data (current) and census data (baseline study) shows more than 15% of municipalities moving between strata, with management conditions being the main change factors. The variables used summarize municipal management conditions and were proposed based on

the baseline study through factor analysis of 28 variables analyzed in the literature as being important for health management. The urbanization rate and demographic density differentiate more urbanized municipalities from those with a more disperse population where resource allocation and access is more difficult; per capita GDP indicates differences in the municipality's own capacity to invest in health; and the population's dependence on public health services can be measured by private health insurance coverage and by the percentage of the population in extreme poverty.

Change in population size was exclusively responsible for reclassification of just 108 (1.9%) of the municipalities. According to this study, if 842 (15.5%) changed their stratum, it can be concluded that the characteristics associated with management conditions also changed during the five-year interval and caused most of the strata changes.

In the period 2010-2015, GDP increased in Brazil, with a slight increase in expenditure on public health services and actions.[27] Municipalities having a greater increase in GDP and per capita income tend to have more resources for social programs involving income transfer, thus generating greater reduction in income inequality and poverty.[28] Furthermore, considerable progress has been seen since the Bolsa Família Program was implemented in terms of reduction in the numbers of people living in extreme poverty.[29] This underlines the mobility of GDP as an indicator and the need for frequent reconsideration.

It should be noted that in the demographic characteristics, 2010 data were repeated for the urbanization rate, which is one of the indicators relating to management conditions. There is no intercensal collection of this information. Other data on urbanization we identified is calculated by the

Table 2 – Number and percentage of municipalities in each stratum (defined by population size and conditions influencing health management) of intercensal classification, by region of the country, Brazil, 2015

Region	Intercensal classification													
	Large		Medium favorable		Medium regular		Medium unfavorable		Small favorable		Small regular		Small unfavorable	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
North	26	5.8	4	0.9	47	10.5	78	17.4	4	0.9	127	28.4	162	36.2
Northeast	62	3.5	10	0.6	168	9.4	232	13.2	3	0.2	168	9.5	1,142	63.7
Midwest	21	4.5	37	8.0	28	6	1	0.2	49	10.5	285	61.2	44	9.4
Southeast	143	8.6	212	12.7	92	5.5	11	0.7	297	17.8	677	40.6	236	14.2
South	52	4.4	127	10.7	31	2.6	2	0.2	227	19.1	558	47.0	191	16.1
Brazil	304	5.5	390	7.0	366	6.6	324	5.9	580	10.4	1,815	32.7	1,775	31.9

Table 3 – Changes identified in classification by strata (by population size and conditions influencing health management) using census and intercensal data, by region of the country, Brazil, 2015

Region	Population size and management conditions									
	Same population size				Population size changed				Total	
	Same management conditions		Different management conditions		Same management conditions		Different management conditions			
	n	%	n	%	n	%	n	%	n	%
North	356	79.5	71	15.8	20	4.5	1	0.2	448	100.0
Northeast	1,553	86.7	189	10.5	41	2.3	9	0.5	1,792	100.0
Midwest	400	85.8	57	12.2	5	1.1	4	0.9	466	100.0
Southeast	1,415	84.8	223	13.4	27	1.6	3	0.2	1,668	100.0
South	996	83.8	173	14.6	15	1.3	4	0.3	1,188	100.0
Brazil	4,720	84.9	713	12.8	108	1.9	21	0.4	5,562	100.0

Brazilian Agricultural Research Company (EMBRAPA)[30] but relates to household spatial concentration and does not identify whether households are located in the urban or rural area. If it had been possible to use more up-to-date urbanization rates, we might have identified more municipalities changing from one stratum to another.

After five years, great indicator variability was still found between the strata. Reapplying the model proposed confirms its internal validity and coherence in relation to the theoretical reference used by the baseline study. The aim of updating stratification is to provide researchers with information for evaluating the healthcare performance of municipalities with similar conditions of territory, level of economic development and regional role. Stratification seeks to increase the alternatives frequently used by researchers and services, based solely on population size[2-4] or who use, separately, another factor such as the municipal human development index (HDI-M) or Family Health Strategy coverage.[20-22] Based on the analysis presented, these options appear to be insufficient for indentifying homogenous strata of municipalities.

Authors' contributions

Willemann MCA and Medeiros JM contributed with data acquisition and analysis and drafting the preliminary versions of the manuscript. Lacerda JT and Calvo MCM contributed by conceiving the study, interpreting the data and critically revising the manuscript. All the authors have approved the final version and are responsible for all its aspects, including its precision and integrity.

References

1. Fausto MCR, Giovanella L, Mendonça MHM de, Fonseca HMS, Lima JG. A posição da estratégia saúde da família na rede de atenção à saúde na perspectiva das equipes e usuários participantes do PMAQ-AB 2012. Saúde Debate [Internet]. 2014 out [citado 2019 jul 1];38(esp):13-33. Disponível em: http://www.scielo.br/pdf/sdeb/v38nspe/0103-1104-sdeb-38-spe-0013.pdf. doi: 10.5935/0103-1104.2014S003

2. Seidl HMF, Vieira SP, Fausto MCR, Lima RCD, Gagno JL. Gestão do trabalho na atenção básica em saúde: uma análise a partir da perspectiva das equipes participantes do PMAQ-2012. Saúde Debate [Internet]. 2014 out [citado 2019 jul 1];38(esp):94-108. Disponível em: http://www.scielo.br/pdf/sdeb/v38nspe/0103-1104-sdeb-38-spe-0094.pdf. doi: 10.5935/0103-1104.2014S008

3. Pontes MA, Tavares NUL, Francisco PMSB, Naves JOS. Aplicação de recursos financeiros para aquisição de medicamentos para atenção básica em municípios brasileiros. Ciên Saúde Coletiva [Internet]. 2017 ago [citado 2019 jul 1];22(8):2453-62. Disponível em: http://www.scielo.br/pdf/csc/v22n8/1413-8123-csc-22-08-2453.pdf. doi: 10.1590/1413-81232017228.18282016

4. Miclos PV, Calvo MCM, Colussi CF. Avaliação do desempenho das ações e resultados em saúde da atenção básica. Rev Saúde Pública [Internet]. 2017 [citado 2019 jul 1];51:86. Disponível em: http://www.scielo.br/pdf/rsp/v51/pt_0034-8910-rsp-S1518-87872017051006831.pdf. doi: 10.11606/s1518-8787.2017051006831

5. Calvo MCM, Lacerda JT, Colussi CF, Schneider IJC, Rocha TAH. Estratificação de municípios brasileiros para avaliação de desempenho em saúde. Epidemiol Serv Saúde [Internet] 2016 out-dez [citado 2019 jul 1];25(4):767-76. Disponível em: http://www.scielo.br/pdf/ress/v25n4/2237-9622-ress-25-04-00767.pdf. doi: 10.5123/s1679-49742016000400010

6. Instituto Brasileiro de Geografia e Estatística. Contagem da população [Internet]. Rio de Janeiro: Instituro Brasileiro de Geografia e Estatística; 2019 [citado 2019 jan 17]. Disponível em: https://ces.ibge.gov.br/apresentacao/portarias/200-comite-de-estatisticas-sociais/base-de-dados/1147-contagem-da-populacao.html

7. Instituto Brasileiro de Geografia e Estatística. Pesquisa nacional por amostra de domicílios – PNAD 2015 [Internet]. Rio de Janeiro: Instituro Brasileiro de Geografia e Estatística; 201- [citado 2019 jan 18]. Disponível em: https://ww2.ibge.gov.br/home/estatistica/populacao/trabalhoerendimento/pnad2015/default.shtm

8. Instituto Brasileiro de Geografia e Estatística. Estatísticas. Produto interno bruto dos municípios [Internet]. Rio de Janeiro: Instituto Brasileiro de Geografia e Estatística; 2016 [citado 2019 maio 19]. Dispomnível em: https://www.ibge.gov.br/estatisticas-novoportal/economicas/contas-nacionais/9088-produto-interno-bruto-dos-municipios.html?=&t=resultados

9. Ministério da Cidadania (BR). Secretaria Especial do Desenvolvimento Social. Cadastro único - o que é e para que serve [Internet]. Brasília: Ministério da Cidadania; 2015 [citado 2019 jan 18]. Disponível em: http://mds. gov.br/assuntos/cadastro-unico/o-que-e-e-para-que-serve

10. Ministério da Saúde (BR). VIVA inquérito: vigilância e acidentes em serviços sentinelas de urgência e emergência: VIVA inquérito - componente II [Internet]. Brasília: Ministério da Saúde; 2017 [citado 2019 jan 18]. Disponível em: http://portalms.saude.gov. br/vigilancia-em-saude/vigilancia-de-violencias-e-acidentes-viva/vigilancia-de-violencias/viva-inquerito

11. Fundação Oswaldo Cruz. Laboratório de Informação em Saúde. PROADESS: avaliação do desempenho do sistema de saúde [Internet]. Rio de Janeiro: Fundação Oswaldo Cruz; 2011 [citado 2018 maio 29]. Disponível em: http://www.proadess.icict.fiocruz. br/index.php?pag=princ

12. Ministério da Saúde (BR). Índice de desempenho do Sistema Único de Saúde – IDSUS [Internet]. Brasília: Ministério da Saúde; 201- [citado 2018 jun 26]. Disponível em: http://idsus.saude.gov.br/avaliativo.html

13. Ministério da Saúde (BR). Secretaria de Atenção Primária à Saúde. Portal do Departamento de Atenção Básica [Internet]. Brasília: Ministério da Saúde; 201- [citado 2018 jun 26]. Disponível em: http://dab. saude.gov.br/portaldab/ape_pmaq.php

14. Ministério da Saúde (BR). Departamento de Informática do Sistema Único de Saúde – Datasus. Informações de saúde (TABNET): demográficas e socioeconômicas [Internet]. Brasília: Ministério da Saúde; 201- [citado 2018 maio 29]. Disponível em: http://www2.datasus.gov. br/DATASUS/index.php?area=0206&id=6943&VObj=h ttp://tabnet.datasus.gov.br/cgi/deftohtm.exe?ibge/cnv/popt

15. Agência Nacional de Saúde Suplementar (BR). Dados e indicadores do setor [Internet]. Brasília: Agência Nacional de Saúde Suplementar; 201- [citado 2018 maio 29]. Disponível em: http://www.ans.gov.br/ perfil-do-setor/dados-e-indicadores-do-setor

16. Governo do Brasil. Cadastro único para programas sociais – CadÚnico. Brasília: Governo do Brasil; 2017 [citado 2018 maio 29]. Disponível em: http://www. brasil.gov.br/economia-e-emprego/2010/03/cadunico

17. Lima AB, Paes A, Sambiase AGF, Hullen ACN, Ribeiro BAS, Borges CM, et al., editores. Manual do pesquisador - Programa Bolsa Família [Internet]. Brasília: Ministério do Desenvolvimento Social; 2018 [citado 2019 maio 29]. 86 p. Disponível em: https:// aplicacoes.mds.gov.br/sagirmps/ferramentas/docs/ manual_do_pesquisador_gestao_bolsa_familia.pdf

18. Fernandes LS, Peres MA. Associação entre atenção básica em saúde bucal e indicadores socioeconômicos municipais. Rev Saúde Pública [Internet]. 2005 dez [citado 2019 jul 1];39(6):930-6. Disponível em: http://www.scielo. br/pdf/rsp/v39n6/26988.pdf. doi: 10.1590/S0034-89102005000600010

19. Ibañez N, Rocha JSY, Castro PC, Forster AC, Novaes MHD, Viana ALA. Care performance assessment of primary health care services in the State of São Paulo. Ciên Saúde Coletiva [Internet]. 2006 Jul-Sep [cited 2019 Jul 1];11(3):683-703. Available from: http://www.scielo.br/pdf/csc/v11n3/30983.pdf. doi: 10.1590/S1413-81232006000300016

20. Tomasi E, Oliveira TF, Fernandes PAA, Thumé E, Silveira DS, Siqueira FV, et al. Structure and work process in the prevention of cervical cancer in Health Basic Attention in Brazil: Program for the Improvement of Access and Quality. Rev Bras Saúde Matern Infant [Internet]. 2015 Apr-Jun [cited 2019 Jul 1];15(2):171-80. Available from: http://www.scielo.br/pdf/rbsmi/v15n2/1519-3829-rbsmi-15-02-0171.pdf. doi: 10.1590/S1519-38292015000200003

21. Viana ALA, Bousquat A, Pereira APCM, Uchimura LYT, Albuquerque MV, Mota PHS, et al. Tipologia das regiões de saúde: condicionantes estruturais para a regionalização no Brasil. Saúde Soc [Internet]. 2015 jun [citado 2019 jul 1];24(2):413-22. Disponível em: http://www.scielo.br/pdf/ sausoc/v24n2/0104-1290-sausoc-24-02-00413.pdf. doi: 10.1590/S0104-12902015000200002

22. Neves RG, Duro SMS, Muñiz J, Castro TRP, Facchini LA, Tomasi E. Estrutura das unidades básicas de saúde para atenção às pessoas com diabetes: ciclos I e II do Programa Nacional de Melhoria do Acesso e da Qualidade. Cad Saúde Pública [Internet]. 2018 [citado 2019 jul 1];34(4):308-11. Disponível em: http:// www.scielo.br/pdf/csp/v34n4/1678-4464-csp-34-04-e00072317.pdf. doi: 10.1590/0102-311x00072317

23. Lima-Costa MF, Matos DL, Camargos VP, Macinko J. Tendências em dez anos das condições de saúde de idosos brasileiros: evidências da Pesquisa Nacional por Amostra de Domicílios (1998, 2003, 2008). Ciên Saúde Coletiva [Internet]. 2011 set [citado 2019 jul 1];16(16):3689-96. Disponível em: http://www.scielo.br/pdf/csc/v16n9/ a06v16n9.pdf. doi: 10.1590/S1413-81232011001000006

24. Carleial LMDF. Política econômica, mercado de trabalho e democracia: o segundo governo Dilma Rousseff. Estud Av [Internet]. 2015 set-dez [citado 2019 jul 1];29(85):201-14. Disponível em: http://www. scielo.br/pdf/ea/v29n85/0103-4014-ea-29-85-00201. pdf. doi: 10.1590/S0103-40142015008500014

25. Limão NP, Ferreira Filho JCC, Protásio APL, Santiago BM, Gomes LB, Machado LS, et al. Equipamentos e insumos odontológicos e sua relação com as unidades da atenção primária à saúde. Rev Bras Promoç Saúde [Internet]. 2016 jun-mar [citado 2019 jul 1];29(1):84-92. Disponível em: https://periodicos.unifor.br/RBPS/article/view/4035/pdf

26. Miclos PV, Calvo MCM, Colussi CF. Evaluation of the performance of actions and outcomes in primary health care. Rev Saúde Pública [Internet]. 2017 Sep [cited 2019 Jul 1];51:86. Available from: http://www.scielo.br/pdf/rsp/v51/0034-8910-rsp-S1518-87872017051006831.pdf. doi: 10.11606/s1518-8787.2017051006831

27. Vieira FS, Benevides RPS, editores. Os impactos do novo regime fiscal para o financiamento do Sistema Único de Saúde e para a efetivação do direito à saúde no Brasil [Internet]. Brasília: Instituto de Pesquisa Econômica e Aplicada; 2016 [citado 2019 jul 1]. Disponível em: http://www.ipea.gov.br/portal/index.php?option=com_content&id=28589

28. Denes G, Komatsu BK, Menezes-Filho N. Uma avaliação dos impactos macroeconômicos e sociais de programas de transferência de renda nos municípios brasileiros. Rev Bras Econ [Internet]. 2018 jul-set [citado 2019 jul 1];72(3):292-312. Disponível em: http://www.scielo.br/pdf/rbe/v72n3/0034-7140-rbe-72-03-0292.pdf. doi: 10.5935/0034-7140.20180014

29. Silva Neto DR, Oliveira SV. Políticas sociais e pobreza no Brasil: desafios em direção ao desenvolvimento humano Social. Rev Textos Econ [Internet]. 2017 [citado 2019 jul 1];20(1):51-71. Disponível em: https://periodicos.ufsc.br/index.php/economia/article/view/2175-8085.2017v20n1p51/35330. doi: 10.5007/2175-8085.2017v20n1p51

30. Farias AR, Mingoti R, Valle LB, Spadotto CA, Filho EL. Identificação, mapeamento e quantificação das áreas urbanas do Brasil. Comun Técn [Internet]. 2017 maio [citado 2019 jul 1];4:1-5. Disponível em: https://ainfo.cnptia.embrapa.br/digital/bitstream/item/176016/1/20170522-COT-4.pdf