Statistic in Illustration Art : Statistics Dissemination for Young People

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Abstract

Statistical anxiety is common among teenagers and children. The stigma that statistics are complicated makes teenagers and children reluctant to study statistics. In fact, instilling knowledge and concern for statistics to children is important to build a data driven society. The National Statistical Office needs to take an approach to increase awareness of statistical data among young people. One of them is by combining illustration art with statistics. Teenagers have an interest in art that can relate to their taste. Relevant and interesting impression is an important key in making statistical dissemination for teenagers and children. Statistics Indonesia takes various approaches through fun illustration art in making statistical dissemination targeted to teenagers and children. This article proposes about the experience of statistics Indonesia in carrying out an illustration art approach to build statistical literacy among adolescents and children.

STATISTIC IN ILLUSTRATION ART

Statistics Dissemination for Young People

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Abstract

Statistical anxiety is common among teenagers and children. The stigma that statistics are complicated makes teenagers and children reluctant to study statistics. In fact, instilling knowledge and concern for statistics to children is important to build a data driven society. The National Statistical Office needs to take an approach to increase awareness of statistical data among young people. One of them is by combining illustration art with statistics. Teenagers have an interest in art that can relate to their taste. Relevant and interesting impression is an important key in making statistical dissemination for teenagers and children. Statistics Indonesia takes various approaches through fun illustration art in making statistical dissemination targeted to teenagers and children. This article proposes about the experience of statistics Indonesia in carrying out an illustration art approach to build statistical literacy among adolescents and children.

Keywords: Art, Literacy, Dissemination, Communication

topics: S4 Tailoring communication to specific audiences

Introduction

In today's digital era, the exchange of information on the internet has become a part of everyone's life. However, the internet does not only present true information but also false information or hoax news. People who do not have statistical literacy will easily fall prey to fake news and even participate in spreading it. This phenomenon is called a post truth society, when people trust fake news more than true data. This continues to cause various disturbances in society. However, this can be overcome by building statistical literacy in the community from an early age. Implementing statistical knowledge from childhood and

adolescence is a good investment when they grow up and of course for the wider community. Gal (2002) said that statistical literacy is the ability to interpret, critically evaluate, and communicate about statistical information and messages. He argues that statistical literacy is enabled by five inter-related knowledge bases: literacy, statistical, mathematical, context, and critical, together with essential supporting dispositions and beliefs. Garfield and Ben-Zvi (2007) said that statistical literacy involves understanding and using the basic language and tools of statistics: knowing what basic statistical terms mean, understanding the use of simple statistical symbols, and recognizing and being able to interpret different representations of data.

Yuniarti (2019) mentioned that statistical literacy is part of the responsibilities of National Statistical Office (NSO). Therefore, building statistical literacy in the community is one of the big focuses for BPS (Badan Pusat Statistik-Statistics Indonesia). Statistical literacy can not only increase public awareness of statistics but will also have a major impact on the world of statistics in Indonesia. For example, people become aware of the importance of the statistical data they provide for nation building. Great awareness of statistics will also create a data driven society that makes people more productive.

However, there are various challenges faced in building statistical literacy in children and adolescents, one of which is statistical anxiety. Onwuegbuzie, DaRos, and Ryan (1997) explained that statistical anxiety as a state-anxiety reaction to any situation in which a student is confronted with statistics in any form and at any time. The reaction could like worry, tension, and physiological symptoms of stress when students are faced with taking a statistical class (Zeidner, 1991). Statistical anxiety is experienced by many children or teenagers who are new to statistics because of the level of difficulty. Statistics become something scary and tend to be avoided. This is also experienced by many adults so that it is easier for them to believe fake news compared to statistical data.

BPS takes various approaches in building statistical literacy in children and adolescents. Building statistical literacy in school-age children is similar to BPS investing in statistical knowledge in the younger generation. The biggest challenge is statistical anxiety. BPS should create complex statistical materials using an approach that is easy for children to understand. The Covid-19 pandemic is also a big challenge to be able to reach school-age children because they cannot meet in person.

Children and teens tend to like fun visualizations and illustrations. The approach to art and colorful illustrations will be a special attraction for children and adolescents compared to graphs and tables that seem formal. Therefore, this study takes an approach to build statistical literacy in children and adolescents through interesting illustrations, art, infographic, and comics and how to reach them, especially during the Covid-19 pandemic.

Research question : How to build statistical literacy in children and adolescents, especially during the Covid-19 pandemic?

Methodology

Statistical anxiety makes some people, especially children, avoid statistics because they consider statistics to be something difficult. To build statistical literacy in children and adolescents, we need to approach the things they like, such as pictures and illustrations in a language that is simple and easy to understand. Making statistics fun is key to successful communicating statistics to children and young people.

1.   Before the Covid-19 Pandemic

BPS has started investing knowledge of statistics in school children for a long time. There are various ways that BPS does to build statistical literacy among school children, one of which is visiting schools. Explaining statistics to basic education children is a challenge in itself. We have to turn a lesson in statistics into something as fun as a game and use lots of colorful pictures and tools. With simple language, we should be able to give the impression that statistics is a subject matter that is not scary. This can prevent students from experiencing statistical anxiety.

Figure 1. Putu Dharma Yusa, a BPS employee, is playing a game with elementary school children to introduce statistics.

2.   After the Pandemic

The world has been facing the COVID-19 pandemic for more than a year since the World Health Organization (WHO) declared COVID-19 a global pandemic on March 11, 2021. The COVID-19 pandemic has boosted digitalization adoption in all sectors around the world. The public is required to adapt to all the limitations of their daily activities to reduce the number of additional active cases of COVID-19. This pandemic has hindered face-to-face meetings with school children. BPS should build statistical literacy for school children using other means. One of them is creating content on social media by combining attractive visual art with statistics.

According to Oxford dictionary, art is a diverse range or product of human activity involving creative imagination to express technical proficiency, beauty, emotional power, or conceptual ideas. Root-Bernstein et al (2011) mentioned that the arts are emerging as a favored approach for science communication in formal and informal settings for the general public. Scientist draw to clarify ideas for colleagues, students, and public (Kozma et al, 2000). In externalizing private knowledge more permanently, visual representation is one way to enable broader dissemination (Latour et al, 1999).

Humans are visual creatures who are psychologically influenced by various visual arts. It's almost 50 % of human brain is involved in visual processing and 70% of all human sensory receptors are in eyes (Merieb & Hoehn, 2007). People following text and illustration do 323% better than people following directions without illustrations (Levie & Lentz, 1982). We can see how great the potential is in using visual art to help build statistical literacy.

The use of illustrations in communicating science is not a new thing, as is the use of pictures and comics to communicate statistical activities. we can see how ancient civilizations communicated through pictures in caves around the world. Larry Gonick and Woollcot Smith (1993) created a statistical comic entitled The Cartoon Guide to Statistics. Shin Takahashi (2008) created a manga entitled "The Manga Guide to Statistics" along with several other statistical manga titles. Yuniarti & Faris (2018) used comics to promote Seasonal Adjustment in Indonesia. Another method to communicate statistics is making infographics with illustration. Scratched illustrations make children feel more relatable because it gives the impression that they were made by children too.

2.1.   Infographic Illustration

In contrast to ordinary infographics which are often created using a vector approach, Infographic Illustration uses an illustration stroke approach in its creation. The function of Infographic Illustration is the same as infographics in general, but the illustration stroke approach can make children relate more because it looks like it was made by children too. Scratched children illustrations give a feeling of fun and very friendly for children so as to increase their awareness in reading the statistical info in it.

The process of creating an illustrative infographic is slightly different from a vector infographic because the illustrator of an infographic must have the ability to draw. NSO can work with child illustrators in the creation of infographic illustrations or at least in the creation of assets that can be used for future infographics. Here are tips on the process of making infographic illustrations:

2.1.1.   Illustration Assets

One of the things that can make it easier for us to make infographic illustrations is that we have a lot of image assets. Therefore, we don't have to redraw everything when we need to illustrate infographics in the future. We can use various image assets that we have many times. The following are the assets of character illustrations in the Indonesian cultural approach:

Figure 2. Men Character illustration with Indonesian Traditional Cloth

Figure 3. Women Character illustration with Indonesia Traditional Cloth

2.1.2. Tools

Infographics can be created by hand, using paper and pencil, or created with a software. In this paper, infographic illustrations are made using Procreate on iPad. It is a raster-based drawing program that is meant for hand drawing using a stylus.

2.1.3. Step by Step Illustration Infographic

Ferreira (2014) mentioned that Infographics are created for different purposes, for some companies they are produced as a marketing tool, for some NGOs they are used to raise awareness of an issue, for academics they might be used to introduce a research project, to highlight some research findings or simply to start sharing ideas about a topic.

Here are some steps in making infographics:

a. Make the theme, story or message clear

Infographics need to have a clear theme, story or message. We have statistical data that will be made into an infographic illustration. A big theme must be determined because it affects the design that will be made. We have to determine what should get the highlight. Every infographic illustration should have a simple story that shows at least what's going on there.

Table 1. Key Statistics of Sumatera Utara (North Sumatera) Province

SOCIAL		
Description	Unit	2016 (Year)
(1)	(2)	(3)
Population	000 people	14,102.9
Labor Force Participation Rate	%	65.99
Open Unemployment Rate	%	5.84
Poor People	000 people	1,452.6
Percentage of Poor People	%	10.27
Human Development Index	%	70.00

ECONOMIC		
Description	Unit	2016 (Year)
(1)	(2)	(3)
GRDP at Current Price	Trillion Rupiahs	628.39
Economic Growth	%	5.18
Per Capita GRDP at Current Price	Million Rupiahs	44.56
Gini Ratio	-	0.319

In this case, the theme is key statistics of provinces in Indonesia. As shown in Table 1, the key statistics consist of social and economic indicator of Sumatera Utara Province. The message is to share information about socio-economic in Indonesia provinces.

b. Infographic sketch and final result

A good way to start designing the infographic is to create infographic sketch. Depending on the size and simplicity, a rough sketch or more detailed one is really useful for mapping the project. As mentioned in the book titled Infographic for Dummies by Beegel (2014), infographic sketch should consist of the following elements:

- Spots for title and introduction
- Rough renderings of charts, graphs, and other data visualization
- Approximations of illustrations in use
- Spots for section headings
- Rough placement of data
- Fonts and color palettes (optional)
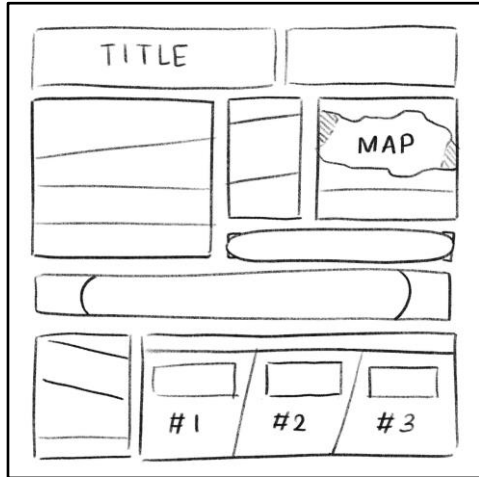
Figure 4. Infographic Sketch
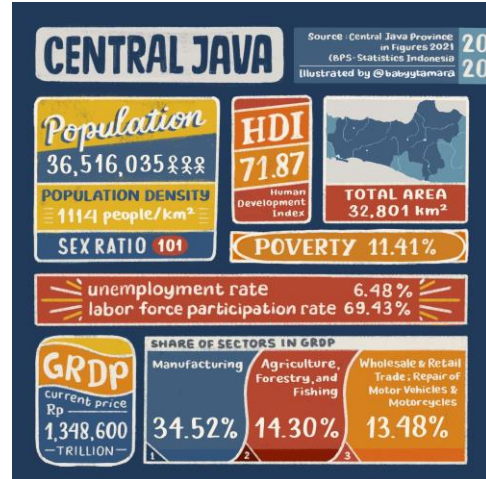
Figure 5. Final result

The sketch could be simple, like Figure 4. It consists of title, illustration, and rough placement of main components of the infographic. This helps us to figure out how the components might fit together in an infographic. As shown in Figure 5, the final result is socio-economic indicators of Central Java Province in Indonesia.

Making an infographic design really depends on who the target audience is. We need to be aware of the complexity of information presented. In this study, the target audience is children, therefore the design is made to choose colors that are fun for children. We want to keep the complexity to a minimum because the reader may know very little about the subject. If the target audience is an expert, then difficult or more expert terms can be used and highly complex charts may be desirable.

Hermanto (2019) examined about visual storytelling using illustration for children. The study explain that illustration can help to make storytelling process more effective. Illustrations for children are a visual attraction to know further about of the story. Figure 6 shows infographic using Papuan traditional clothing illustration.
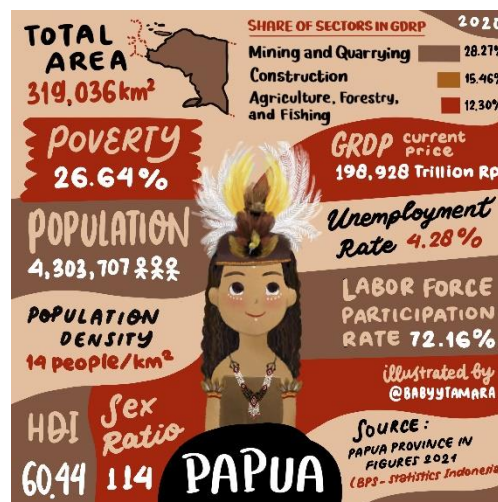
Figure 6. Infographic with Papuan Traditional Cloth Illustration

c. Make it visually appealing

Depending on the content of the infographic and the target audience, we need to draw reader interest. We need to get readers' attention by making it visually appealing. We need to consider the choice of color and font. It plays an important role in visual design. To choose the color, we need to consider color harmony.

Weingrl and Javorsek (2018) explain that color harmony can be defined as a set of colors that produce a pleasing effect when seen together. There are many color harmony models. One of them is hue-based color harmonies. It can be defined as fixed sets of rotations around the color wheel. There are six basic hue color harmonies:

- Monochromatic harmony: colors with similar or equal hue,
- Complementary harmony: colors lying opposite each other on the color wheel,
- Analogous harmony: colors with similar hues, lying next to each other on the color wheel,
- Triadic harmony: three colors that have separated hues by about 120 degrees on the color wheel
- Split-complementary harmony: includes three colors, with two being either side of the complement of the third on the color wheel,
- Tetradic harmony: double complementary scheme, two complementary pairs lying opposite each other on the color wheel
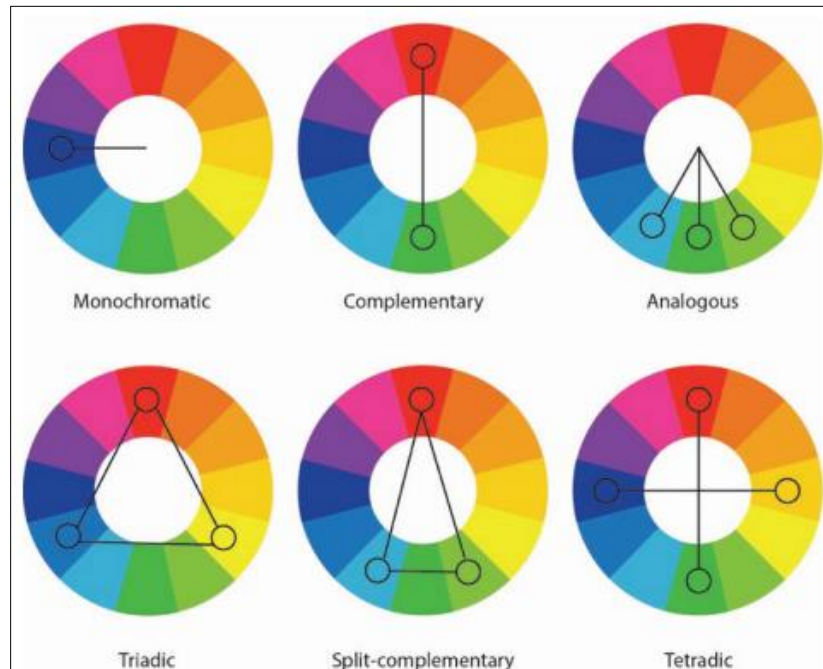
Figure 7. Six basic hue color harmonies

Color harmony is important to develop the color palette. Creating color palette is important to set the mood and theme of the infographic. Figure 8 below shows the infographic with color palette and harmonic colors used in the infographic.
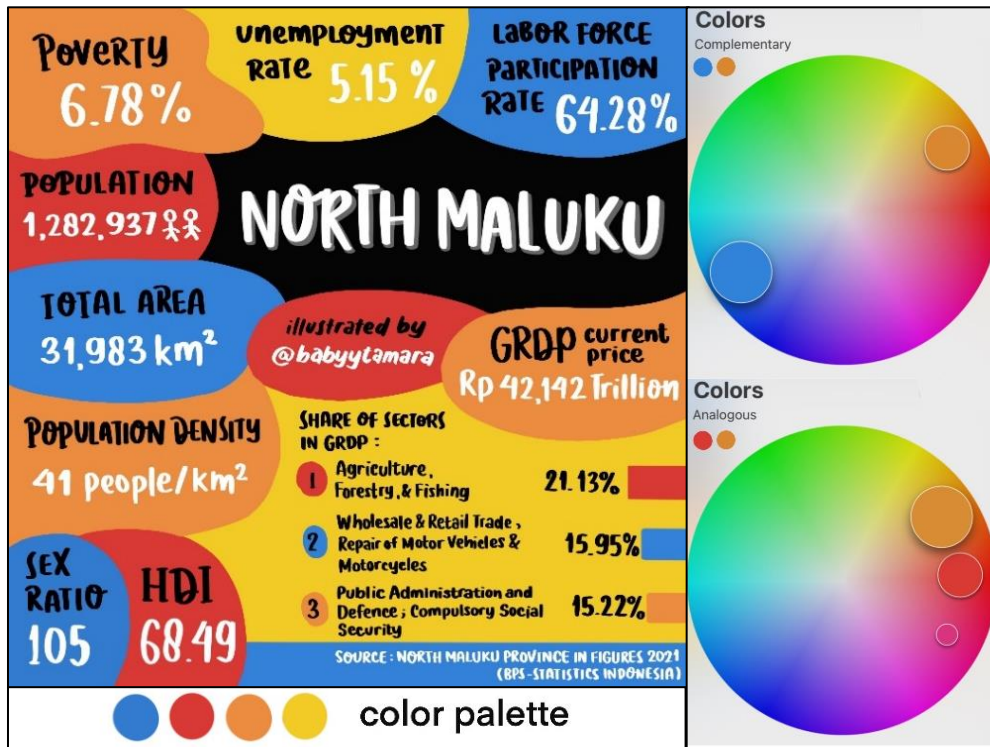
Figure 8. North Maluku Infographic with Color Palette

In a study conducted in 1994, Boyatzis and Varghese stated that children had positive reaction to bright colors such as blue, red, and yellow. For example, children associate red with excitement and happiness. Children's emotional reactions to bright colors became increasingly positive with age.

d. Consider the size

There is no one-size-fits-all approach. We need to consider what size will work best depending on how much content to display and where to publish (in print or online). In this case, infographic illustrations are posted on Facebook and Instagram. Therefore, size used is 3000x3000 pixels with 1:1 aspect ratio so that reader can compare the infographics between regions in Indonesia in social media display without any image crop.

e. Consider simplicity

In making infographics, we need to make complex information simple and use attractive design to present the information. We need to consider simplicity by using balance. Balance is the distribution of elements of the design. Adequate balance gives the infographic visual stability, preventing one element from dominating the visual and inappropriately pulling readers' focus (Beegel, 2014).
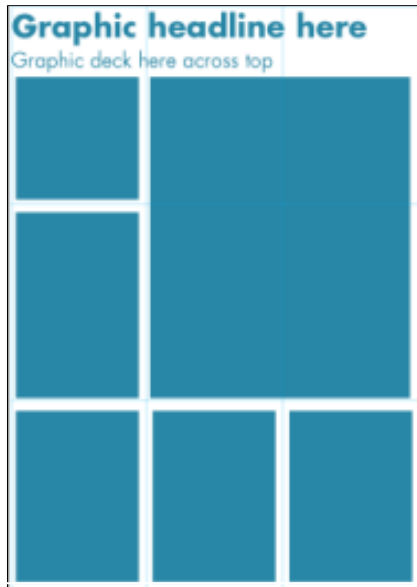
Figure 9. Balancing visual elements in infographic.
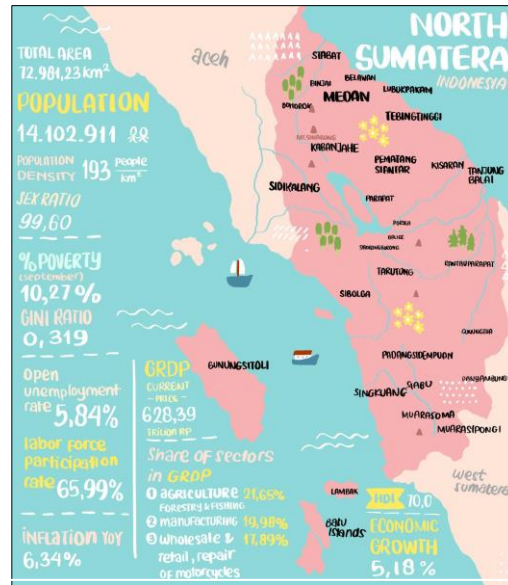
Figure 10. North Sumatera Province Infographic Illustration

Figure 9 shows example of balancing visual elements in infographic (Beegel, 2014). The rule of thumb is to divide the elements using grid. This is applied in Figure 10, to make the infographic illustration nicely balanced and using line to separate the words.

f.   Use your data effectively

We need to consider how to effectively showcase the data, whether the data is better to presented by table, graph, or numbers. In this case, data is presented by displaying the data directly and include some maps, graphs and illustrations.

g.   Consider the impact

After the design process is done, next step is to publish the infographic. The goal of almost every infographic producer is to make the infographic viral. In other words, you want it to be shared around the internet (Beegel, 2014). Getting shared on social media exposes your infographic to a lot more people and impact readers. It means, people will be more likely aware of the statistics shared, in this case, the socio-economic key statistic of province in Indonesia. This can raise awareness about statistics.

2.2.   Comic

Visual narratives, such as comics and animations, are becoming increasingly popular as a tool for science education and communication. Combining the benefits of visualization with powerful metaphors and character-driven narratives, comics have the potential to make scientific subjects more accessible and engaging for a wider audience (Farinella, 2018). However, some studies are limited to audiences that are only students in the classroom, such as those conducted by Hosler and Boomer (2011) or Spiegel et al (2013). Existing studies have focused on stereotypical perceptions of comics, such as their 'humorous' nature and their appeal to children (partly because many studies were conducted in the classroom). This approach ignores the rich and diverse tradition of comics, which have adopted a wide variety of registers

and styles and successfully engaged audiences of all ages (Farinella, 2018). Yuniarti & Faris (2018) conducted research on comics as a statistical education tool in explaining seasonal adjustments and inflation.

2.2.1. Storytelling

Every comic needs a good story in the process of making it as well as science communication. Storytelling, an effective method for scientific communication, has been used not only for a general audience, but also among scientific communication experts and practitioners (Riedlinger et al., 2019).

2.2.2. Comic Illustration

The second stage after making the script is making comic illustrations. The comic format is made in a comic strip format consisting of several portrait slides with a size ratio of 4:5. Conversations between characters are made to flow according to the draft that has been made. The conversation is inserted into the image of the sound balloon. Humor can be inserted in the middle of the story or at the end of the story to become a punchline that gives a surprise effect to the readers (Faris & Pramana, 2021).

Figure 11. Big Data Comic Illustration

Results

The illustration infographic received a good response both on Facebook and Instagram RB BPS (Bureaucratic Reform of Statistics Indonesia). Illustration infographic is a special attraction for visitors to the BPS website because it is different from vector infographics in general. This gives a new color to statistical communication at BPS and of course increases public awareness of BPS data. Figure 12 shown the enthusiasm of social media visitors towards the infographic illustrations is quite high. The post managed to get 122 shares and 123 reactions from visitors as well as 200 impressions. There is no visible negative feedback on the post.
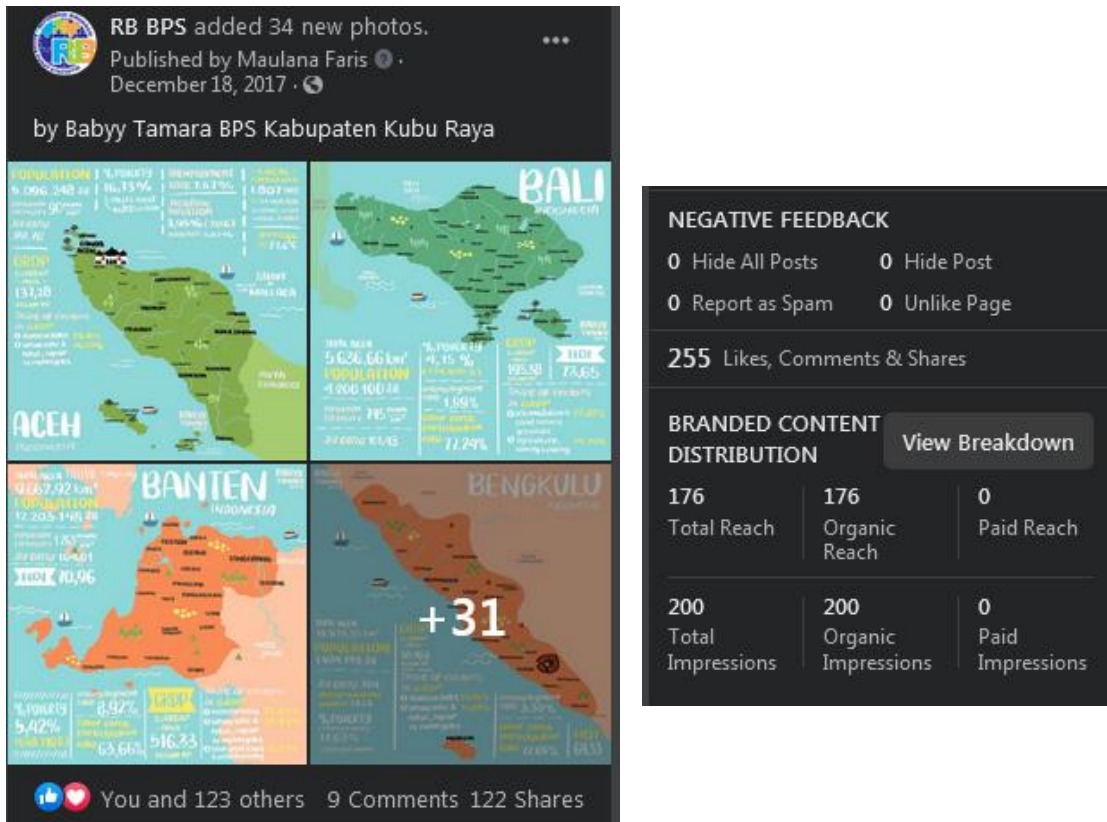
Figure 12. Insight Data from Infographic Illustration at RB BPS Facebook page

Figure 13 shows data insight about illustrations as communication material for statistical activities on the official BPS Instagram. The content managed to get 2,282 likes with 55 comments and 98 shares. And the illustration post managed to reach up to 23,550 Instagram accounts. Figure 14 shows data insight on infographic illustrations as statistical dissemination in the personal account of one of the BPS employees. The infographic illustration post managed to get 459 likes, 11 comments and 3 shares and 17,627 accounts. This shows that the enthusiasm of Instagram visitors is still awake, both through the official BPS account and the personal account of BPS employees.

Figure 13 Insight Data from Infographic Illustration at BPS Official Instagram

Figure 14. Insight Data from Infographic Illustration at Personal Account of BPS Employee

Figure 14. Statistic for Big Data Comic First Edition in Statistics Indonesia Facebook Fan Page

Figure 14 is the result of Statistics Indonesia FB fan page visitor from the first edition of big data comic after 20 days (July 9th -29th, 2021). This post managed to reach 17,495 people. This comic managed to get 368 reactions from readers and without any negative feedback. These reactions include 308 likes, 5 loves, 6 comments, and 49 shares.

Lesson and Discussion

Our research question is "How to build statistical literacy in children and adolescents, especially during the Covid-19 pandemic?". We found that the visual storytelling using illustration infographic and comic can success increase awareness the readers about statistic. Social media also helps to facilitate infographic and comic illustration content to reach readers without having to meet them in person.

The weakness of this study is that there is an age limit for social media users, which is above 13 years. Therefore, we cannot reach children under the age of 13 to socialize statistics and build statistical literacy in them. For children under the age of 13, it is indeed more effective if we meet and teach them directly through interesting games as did BPS before the COVID-19 pandemic. But for now, this cannot be done until the core pandemic can be more controlled.

Conclusion

The study shoes that improving statistical literacy through illustration infographic and comics are noteworthy approach and it has been accepted widely by kids and adolescents using social media.

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Appendix

ACEH — INDONESIA

POPULATION 5.096.248
POPULATION DENSITY 90 people/km²
SEX RATIO 99,76
% POVERTY 16,73% (19,11% rural, 10,82% urban)
UNEMPLOYMENT RATE 7,57%
headline INFLATION 3,95% (2016) national: 3,02%
— LOCAL — EARTHQUAKE 1.807 TIMES (24 were felt, 11 times + from outside Aceh)
average 27,6°C
GRDP CURRENT — PRICE — 137,28 TRILION RP
Share of sectors in GRDP
① agriculture 29,41%
② Wholesale & retail, repair of motorcycles 16,33%
BANDA ACEH, SABANG, Brueh Island, JANTHO, SIGLI, LHOKSUKON, LHOKSEUMAWE, TELUKMEUREUDU, BIREUN, TANGSE, MALLACA STRAIT, STRAIT OF MALLACA, REDELONG, LANGSA, KUALA SIMPANG, TAKENGON, MEULABOH, BLANG PIDON, KUTACANE, TAPAKTUAN, KANDANG, north Sumatera, SIMEULUE ISLAND, KAMPUNGPIE, SINGKIL, Banyak Island
BABYY Tamara 2017

BALI — INDONESIA

BALI SEA, east Java, GILIMANUR, SINGARAJA, KUBUTAMBAHAN, KINTAMANI, TEJAKULA, SERIRIT, BANGLI, BEDUGUL, KINTAMANI, NEGARA, MENDOYO, TABANAN, PUPUAN, PETANG, PENELOKAN, AMLAPURA, TEGALLALANG, KLUNGKUNG, ANTASARI, TAMPAKSIRING, KARANGASEM, BALI STRAITS, TABANALOT, MENGWI, UBUD, GIANYAR, PADANGBAI, SUKAWATI, LOMBOK STRAITS, DENPASAR, SANUR, KUTA, TUBAN, BENOA, JIMBARAN, NUSA DUA, JUNGUTBATU, NUSA CENINGAN, PENIDA, TOYAPAKEH
TOTAL AREA 5.636,66 km²
POPULATION 4.200.100
POPULATION DENSITY 745 people/km²
SEX RATIO 101,43
% POVERTY 4,15 % (174.940)
unemployment rate 1,89%
labor force participation rate 77,24%
GRDP CURRENT — PRICE — 195,38 TRILION RP
HDI 73,65
Share of sectors in GRDP
① accomodation & food service activities 22,82%
② agriculture, foresty, & fishing 14,74%
BABYY Tamara 2017

BANTEN — INDONESIA

TOTAL AREA 9.662,92 km²
POPULATION 12.203.148
POPULATION DENSITY 1.263 people/km²
SEX RATIO 104,01
HDI 70,96
lampung, MERAK, BANTEN, CILEGON, SERANG, ANYER, TANGERANG, jakarta, CINANGKA, CHEUSAI, PANDEGLANG, SERPONG, LABUHAN, RANGKASBITUNG, SAKETI, SAJIRA, GUNUNG KENCANA, LEBAK, CIBALIUNG, MALINGPING, west java, CIKAWUNG, BAYAH
% POVERTY 5,42% (658.110)
unemployment rate 8,92%
labor force participation rate 63,66%
GRDP CURRENT — PRICE — 516,33 TRILION RP
Share of sectors in GRDP
① manufacturing 32,61%
② Wholesale & retail, repair of motorcycles 11,94%
③ transportation & warehousing 10,12%
BABYY Tamara 2017

BENGKULU — INDONESIA

west sumatera, Jambi, MIKOMUKO, IPUH, TES, MUARAAMAN, south sumatera, KETAHUN, ARGAMAKMUR, LAIS, CURUP, PADANGLAK TAMBONG, KEPAHIAN, PEKIKNGJARING, PASARSEULMA, TAIS, MASMAMBANG, MASAT, MANNA, PADANGGU, SIMPANGENA, BANTUHAN, MALAKONI, lampung
TOTAL AREA 19.919,33 km²
POPULATION 1.904.793
SEX RATIO 104
average household member
% POVERTY (september) 17,03% (325.600 people)
GRDP CURRENT — PRICE — 55,403 TRILION RP
Share of sectors in GRDP
① agriculture 29,85%
② Wholesale & retail, repair of motorcycles 13,88%
unemployment rate 3,30%
labor force participation rate 72,69%
HDI 69,33
BABYY Tamara 2017

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CENTRAL JAVA
INDONESIA
BABYY TAMARA 2017

TOTAL AREA
32.544,12 km²
POPULATION
34.019.100
POPULATION DENSITY 1.045 people/km²
SEX RATIO 98,39
%POVERTY (september) 13,19%
HDI 69,98
Open unemployment rate 4,63%
labor force participation rate 67,15%
GRDP CURRENT PRICE 1.092,03 TRILION RP
Share OF sectors in GRDP
1 manufacturing 34,82%
2 agriculture 15,05%
3 Wholesale & retail, repair of motorcycles 13,39%

CENTRAL KALIMANTAN
INDONESIA
BABYY TAMARA 2017

TOTAL AREA
153.564 km²
POPULATION
2.550.192
SEX RATIO 109
%POVERTY 5,66% (143.490)
unemployment rate 4,82%
labor force participation rate 71,30%
GRDP CURRENT PRICE 112,44 TRILION RP
HDI 69,13
Share OF sectors in GRDP
1 agriculture, Forestry & Fishing 21,94%
2 manufacturing 16,33%

CENTRAL SULAWESI
INDONESIA
BABYY TAMARA 2017

HDI 67,47
TOTAL AREA 61.841,29 km²
POPULATION 2.921.715
POPULATION DENSITY 47 people/km²
SEX RATIO 104,38
%POVERTY 14,45% (420.500)
unemployment rate 3,29%
labor force participation rate 72,28%
GRDP CURRENT PRICE 120,23 TRILION RP
Share OF sectors in GRDP
1 agriculture, Forestry & Fishing 29,56%
2 construction 12,87%
3 manufacturing 11,87%

EAST JAVA
INDONESIA
BABYY TAMARA 2017

unemployment rate 4,21%
labor force participation rate 66,14%
%POVERTY 11,85% (4.638.530)
TOTAL AREA 47.799,75 km²
POPULATION 39.075.152
POPULATION DENSITY 817 people/km²
SEX RATIO 97,48
GRDP CURRENT PRICE 1.855,04 TRILION RP
Share OF sectors in GRDP
1 manufacturing 28,92%
2 Wholesale & retail, repair of motorcycles 18,00%
3 agriculture 13,31%
HDI 69,74

EAST KALIMANTAN
INDONESIA

north kalimantan

TANJUNGREDEP
RATUPUTIH
BATUAPOK
SEPINANG
Tanjungbuaya Island
MUARAWAHAU
SANGKULIANG
MUARAMADU
TAHJUNGMANIS
LUBUKTUTUNG
MUARAWANGAN

TELUKBATANG
KOMBAKBARANGOUT

central kalimantan
MUARAPRAHU
MUARAKAMAN
DAMAI
SAMARINDA
TANJUNGSUI
TENGGARONG
Tarenfang Island
DILANGPUTIH
MUARAKALENG
SANGASANGA
SAM BOJA
Bemarung Island
PANAJAM
BALIKPAPAN
LONG KALIS
PASIRPENGGKONG
TANAHGROT
TANJUNGENU

TOTAL AREA
127.346,92 km²
POPULATION
3.501.232
POPULATION DENSITY 21,49 people/km²
SEX RATIO 110,29

% POVERTY (SEPTEMBER)
6,00%
unemployment rate 7,95%
labor force participation rate 67,79%

GRDP CURRENT – PRICE –
507,07 TRILION RP
HDI 74,59
Share of sectors in GRDP
① mining and quarrying 43,34%
② manufacturing 20,51%

EAST NUSA TENGGARA
INDONESIA
FLORES SEA

West Nusa Tenggara
KOMODO
LABUHAN BAJO
RUTENG
BORONG
BAJAWA
ENDE
MAUMERE
LARANTUKA
Adonara Island
Lomblen Island
Pantar Island
Solor Island
KALABAHI
Alor Island
RINCA

SAWU SEA
Timor Leste Republic
ATAMBUA
KAFEMENANU
WAIKABUBAK
WAINGAPU
Sumba Island
SOE
Sawu Island
KUPANG
Rote Island
TIMOR SEA

TOTAL AREA
47.931,54 km²
POPULATION
5.203.514
SEX RATIO 98
% POVERTY
22,19%
(1.149.920)

GRDP CURRENT – PRICE
84,17 TRILION RP
Share of sectors in GRDP
① agriculture 28,89%
② public administration and defense ; compulsory social security 12,67%

unemployment rate 3,25%
labor force participation rate 69,18%
HDI 63,13

JAKARTA
INDONESIA

KEPULAUAN SERIBU
JAVA SEA
Jakarta Bay

WEST JAKARTA
NORTH JAKARTA
CENTRAL JAKARTA
banten
EAST JAKARTA
SOUTH JAKARTA
west java

TOTAL AREA
662.33 km²
POPULATION
10.277.628
POPULATION DENSITY 15.517,38 people/km²
POVERTY 3,75% (384.300)
POVERTY GAP INDEX 0,46
POVERTY SEVERITY INDEX 0,08

unemployment rate 6,12%
labor force participation rate 66,91%
MINIMUM wage Rp 3.100.000
GRDP 1.164,89 CURRENT – PRICE (SEMESTER 1) TRILION RP
HDI 79,60
CPI 126,27 (December 2016) changes (inflation) 0,27%
Share of sectors in GRDP (SEMESTER 1)
① wholesale & retail, repair of motorcycles 16,64%
② manufacturing 13,59 %
③ construction 12,64%

GORONTALO
INDONESIA

SULAWESI SEA
central sulawesi
north sulawesi
TRIGGULA
BULOLIA
SUMALATA
ANTINGOLA
KUANDANG
MOLINGGAPOTO
BONGO
LIMBOTO
LEMITO
PAGUYAMAN
TELAGA
TABULO
BUMELA
SUWAWA
POPAYATO
TILAMUTA
GORONTALO
BILUNGALA
TALUDA
TIMBULILATA
TOMINI BAY
MALUKU SEA

Unauna Island
Walea bahi Island
Togian Island
Batudaka Island
Paot Island

TOTAL AREA
12.435 km²
POPULATION
1.150.765
SEX RATIO 100,38
POPULATION DENSITY 92 people/km²

% POVERTY
17,72%
unemployment rate 2,76%
labor force participation rate 67,89%

GRDP CURRENT – PRICE
31,82 TRILION RP
HDI 66,29
Share of sectors in GRDP
① agriculture, forestry, & fishing 37,44%
② construction 12,00%

18

JAMBI
INDONESIA

BABYY TAMARA 2017

GRDP CURRENT PRICE
171,711 TRILION RP

POPULATION
3.458.926

TOTAL AREA
53.435 km²

SEX RATIO 1,04

UNEMPLOYMENT RATE 8,12%

INFLATION RATE consumer price
4,54%

Share of sectors in GRDP
1 agriculture 29,79%
2 mining & quarrying 16,59%
3 wholesale and retail trade, repair of motor vehicles & motorcycles 12,15%

KEPULAUAN RIAU
INDONESIA

BABYY TAMARA 2017

NORTH NATUNA SEA
NORTH NATUNA ISLAND
NATUNA ARCHIPELAGO
ANAMBAS ARCHIPELAGO
NATUNA SEA
malaysia
BATAM
TANJUNG PINANG
RIAU ARCHIPELAGO
riau

TOTAL AREA
8.201,72 km²

POPULATION
2.028.169

POPULATION DENSITY 247 people km²

SEX RATIO 104

GRDP CURRENT PRICE
216,58 TRILION RP

% POVERTY
5,84%
(119.104)

Share of sectors in GRDP
1 manufacturing industry 38,98%

KEPULAUAN BANGKA BELITUNG
INDONESIA

BABYY TAMARA 2017

KARIMATA STRAIT
PANGKALPINANG
TANJUNGPANDAN
south sumatera

TOTAL AREA
81.725,23 km²

POPULATION
1.401.827

POPULATION DENSITY 86 people km²

SEX RATIO 108

% POVERTY
5,22%

economic GROWTH 4,11

open unemployment rate 2,60%

labor force participation rate 70,53%

GRDP CURRENT PRICE
65.125 TRILION RP

HDI
69,55

Share of sectors in GRDP
1 agriculture 20,15%
2 manufacturing 20,05%
3 wholesale & retail, repair of motorcycles 14,83%

LAMPUNG
INDONESIA

BABYY TAMARA 2017

TOTAL AREA
35.288,35 km²

POPULATION
8.205.141

POPULATION DENSITY 237 people km²

SEX RATIO 105

south sumatera
bengkulu
MENGGALA
KOTABUMI
LIWA
METRO
BANDAR LAMPUNG
JAVA SEA
banten

GRDP CURRENT PRICE
281.113 TRILION RP

Share of sectors in GRDP
1 agriculture 33,77%
2 manufacture 17,52%
3 wholesale & retail, repair of motorcycles 11,03%

unemployment rate 4,62%

labor force participation rate 69,61%

% POVERTY
13,86%
(september)
(1.169.600)

HDI
67,65

NORTH SUMATERA
INDONESIA

aceh

TOTAL AREA
72.981,23 km²

POPULATION
14.102.911

POPULATION DENSITY 193 people/km²

SEX RATIO
99,60

% POVERTY (september)
10,27%

GINI RATIO
0,319

Open unemployment rate 5,84%

labor force participation rate 65,99%

INFLATION YOY
6,34%

GRDP CURRENT PRICE
628,39 TRILION RP

Share of sectors in GRDP
❶ AGRICULTURE 21,65%
FORESTRY & FISHING
❷ manufacturing 19,98%
❸ wholesale & 17,89%
retail, repair of motorcycles

HDI 70,0

ECONOMIC GROWTH 5,18%

BABYY Tamara 2017

STABAT, PANJAI, BELAWAN, LUBUKPAKAM, MEDAN, DAMOROK, TEBINGTINGGI, MELSINABUNG, KABANJAHE, PEMATANG SIANTAR, KISARAN, TANJUNG BALAI, SIDIKALANG, PARAPAT, PORTEA, BALIGE, SIBORONGBORONG, TARUTUNG, RANTAUPARAPAT, SIBOLGA, GUNUNGNIA, GUNUNGSITOLI, PADANGSIDEMPUAN, SINGKUANG, GABU, PANYAMBUNGAN, MUARASOMA, MUARASIPONGI, LAMBAK, Batu Islands

west sumatera

NORTH MALUKU
INDONESIA

BABYY Tamara 2017

PACIFIC OCEAN

Morotai Island, Ray Island, BEREBERE, Doi Island, ASIMIRO, SABATAI BARU, LALODA, TOBELO, LOLOBATA, Ternate Island, WASILE, Halmahera Island, TERNATE, SOASIU, SOFIFI, MABA, Tidore Island, SEGEA, WEDA, Makian Island, MAFA, MALIDI, Gebe Island, Kasiraha Island, YABA, BUSU, HALMAHERA SEA, Mandioli Island, SEPI, Bacan Island, Damar Island, Obilatu Island, Obi Island, LAIWUI, WAILOWEN, Tutulai Island, Taliabu Island, Mangole Island, KAYASA, AUPONHIA, SANANA Sulabesi Island

North Sulawesi

MALUKU SEA

TOTAL AREA
31.982,50 km²

POPULATION
1.815.912

SEX RATIO 104,2

POPULATION DENSITY 57,05 people/km²

unemployment rate 4,01%

labor force participation rate 66,19%

% POVERTY 6,33% (74.680)

GRDP CURRENT PRICE
29,17 TRILION RP

HDI 66.63

Share of sectors in GRDP
❶ agriculture, Forestry, & Fishing 24,96%
❷ wholesale & retail, repair of motorcycles 17,65%

MALUKU
INDONESIA

BABYY Tamara 2017

SERAM SEA, BURU SEA, BARA, NAMLEA, PIRU, OPIN, WAHAI, Buru Island, KAIRATU, MASOHI, BULA, LEKSULA, SAPARUA, TEHORU, WARU, AMAHAI, West Papua, Manipa Island, UANG, HITU, PASO, KULULANA, MOLOTH, AMBON, HARUKU, SAPARUA, Kai Archipelago, AMBON, HATU, HALBANG, Aru Archipelago, WAR, TUAL, LANGUR, OHOBU, Aru Archipelago, OOBO, OOKA, KOBA, DIA, Tanimbar Archipelago, LARAT, Leti Archipelago, UPRAT, Wetar Island, UPUYA, LARAIAS, HILA, Babar Archipelago, Vandena Island, SAUMLAKI, Serwaru Island, SEPA, TEPA, ADAUT, Moa Island, KAFA, ARAFURA SEA, TIMOR SEA, TIMOR LESTE

TOTAL AREA
54.185 km²

POPULATION
1.715.548

SEX RATIO 101,74

POPULATION DENSITY 32 people/km²

% POVERTY 19,18% (327.700)

unemployment rate 7,05%

labor force participation rate 64,51%

GRDP CURRENT PRICE
37,06 TRILION RP

HDI 67,60

Share of sectors in GRDP
❶ agriculture, Forestry & Fishing 23,87%
❷ public administration and defence; compulsory social security 22,43%

NORTH SULAWESI
INDONESIA

BABYY Tamara 2017

Kawio Island, Bukide Island, KENDAHE, TAHUNA, Sangihe Island, MANULU, TAMAKO, SANGIHE ARCHIPELAGO, Merapit Island, Karakelong Island, RAINIS, BEO, Tigu Island, Salibu Island, LIRUNG, ONDONG, Mangarang Kambuah Island, Taguiandang Island, TALAUD ARCHIPELAGO, Biaro Island, Bang Island, RAITA Island, Bangka Island, NOAI, LIKUPANG, MANADO, BITUNG, SULAWESI SEA, TOMOHON, TONDANO, AMURANG, KAWANGKOAN, TOMBATU, IKINOXO, INDOROAKO, BINTAUNA, KOTAMUBAGU, ANTINGOLA, MALLENG, KOTABUNAN, SARONSONG, MALUKU SEA, DUMOGA, PINOLOSIAN, BILUNGALA

TOTAL AREA
13.852 km²

POPULATION
2.436.921

POPULATION DENSITY 167,55 people/km²

SEX RATIO 104,19

% POVERTY 8,20%

unemployment rate 6,18%

labor force participation rate 65,11%

GRDP CURRENT PRICE
100,54 TRILION RP

HDI 71,05

Share of sectors in GRDP
❶ agriculture, Forestry & Fishing 21,71%
❷ wholesale & retail, repair of motorcycles 12,11%

NORTH KALIMANTAN
BABYY Tamara 2017

east malaysia
east kalimantan

TOTAL AREA
75.467,70 km²
POPULATION
666.333 👥
SEX RATIO 113,02

%POVERTY
6,23(%)
unemployment rate 5,23%
labor force participation rate 62,40

GRDP
CURRENT PRICE
507,07 TRILION RP
HDI 69,20

SOUTHEAST SULAWESI
INDONESIA
BABYY Tamara 2017

BANDA SEA
BONE BAY
FLORES SEA

KENDARI
KOLAKA
BAUBAU

TOTAL AREA
38.067,70 km²
POPULATION
2.551.008 👥
SEX RATIO 101,08
population density 67 people/km²

%POVERTY
(september)
12,77% (327.290 👥)
unemployment rate 2,72%
labor force participation rate 73,47%

GRDP
CURRENT PRICE
96,98 TRILION RP
share of sectors in GRDP
① agriculture, forestry, & fishing 29,30%
② mining and quarrying 19,35%
HDI 69,31

PAPUA
INDONESIA
PACIFIC OCEAN
west papua
BIAK
JAYAPURA
NABIRE
WAMENA
TIMIKA
MERAUKE
ARAFURA SEA
BABYY Tamara 2017

TOTAL AREA
316.553,07 km²
POPULATION
3.207.444 👥
SEX RATIO 111,37
population density 10,13 people/km²

%POVERTY
28,40% (914.870 👥)
unemployment rate 3,35%
labor force participation rate 76,70%

GRDP
CURRENT PRICE
178,37 billion Rp
Share of sectors in GRDP
① mining and quarrying 35,50%
② construction 12,92%
③ agriculture, forestry, & fishing 12,11%
HDI 58,05

RIAU
INDONESIA
North sumatera
West sumatera
STRAIT OF MALACCA
DUMAI
PEKANBARU
BENGKALIS

POPULATION
6.500.971 👥
average household 👤👤👤👤
headline inflation 4,04
UNEMPLOYMENT RATE 5,76%

GRDP
CURRENT PRICE
682,35 TRILION RP
%POVERTY
7.98%
4.515,4 thousand people

BABYY Tamara 2017

SOUTH KALIMANTAN
INDONESIA

BABYY Tamara 2017

central kalimantan
east

MAURABAYA
TANJUNG
AMUNTAI TELAGASILABA
BAKAUCENGAL
PONDOKBARU
BALABAN
KANDANGAN
TANJUNGANA LANTAKAN
GUNUNGBATUBESAR
RANTAU
MARABAHAN TAMBARANGAN SUNGAIKUPANG
TANJUNGBATU
BANJARMASIN
MARTAPURA SIMPANGAMPAT KOTABARU
BANJARBARU STAGEN BARANGAS
ALUHALUH
SATUL JAVA SEA
TAKISUNG KINTAP
JORONG

MAKASSAR STRAIT

TOTAL AREA
37.530,52 km²
POPULATION
4.055.500
SEX RATIO 102,83

% POVERTY
(SEPTEMBER)
4,52%
unemployment rate 5,45%
labor force participation rate 71,57%

GRDP
CURRENT – PRICE –
146.32
TRILION RP

HDI 69,05

Share of sectors in GRDP
❶ mining and quarrying 20,87%
❷ agriculture, forestry, & fishing 14,91%

SOUTH SUMATERA
INDONESIA

BABYY Tamara 2017

jambi
BAYUNGLENCIR
SURULANGUN
SUNGAILILING
SUNGSANG
MURARUPIT
SEKAYU
BABAT
PALEMBANG
LUBUKLINGGAU MUARATELITI
INDRALAYA
SUNGAIKERONG PULAU
PRABUMULIH
TULUNGSELAPAN
GUNUNGMEDANG MUARAENIM MUARAKUANG KAYUAGUNG
bengkulu PENDOPO LAHAT
CEMPAKA
PAGARALAM
KOTAAGUNG BATURAJA SIMPANG
lampung
PULAU SEBANGKI

average monthly temperature <18°C

GRDP
CURRENT – PRICE –
355,42
TRILION RP

% POVERTY
13,39%
(1.097.500 ORANG)

POPULATION
8.160.901
POPULATION DENSITY 93,35 people/km²
SEX RATIO 1,03

UNEMPLOYMENT RATE 4,31%

highest inflation 1,12
highest deflation 0,26

SOUTH SULAWESI
INDONESIA

BABYY Tamara 2017

central sulawesi province
west sulawesi province
LIMBUNG BONEBONE
WOTU SOROAKO
LARONA
RANTEPAO
MAKALE PALOPO
ENREKANG
southeast sulawesi province
PINRANG
SINDERENG
PAREPARE
SENGKANG BONE BAY
MAKASSAR STRAITS BARRU
WATANSOPENG
WATAMPONE
PANGKAJENE
MAROS
MAKASSAR SINJAI
TAKALAR
BANTAENG BULUKUMBA
JENEPONTO
Selayar island
BENTENG
BARANGBARANG
FLORES SEA

TOTAL AREA
45.764,53 km²
POPULATION
8.606.375
POPULATION DENSITY 149,51 people/km²
SEX RATIO 95,50

% POVERTY
9,40%
(807.040)
unemployment rate 4,80%
labor force participation rate 62,92%

GRDP
CURRENT – PRICE –
379,21
TRILION RP

Share of sectors in GRDP
❶ agriculture forestry & fishing 23,29%
❷ manufacturing 13,92%

HDI 69,76

WEST JAVA
INDONESIA

BABYY Tamara 2017

JAVA SEA
banten
jakarta
DAUNKALIJAGAN
BEKASI
KRANGSENGLOK CIKAMPEK INDRAMAYU
DEPOK KARAWANG LANDENER
CIRANONG CIKAMPEK JATIBARANG
CIANUR PURWAKARTA KALIJATI SUBANG
CIPANAS LEUWILANG BOGOR
PUNCAK CIPANAS
CIKALONG WETAN PALIMANAN
CIBADAK CICALENGKA CIREBON
CIKUBANG SUKABUMI LEMBANG SUMEDANG MAJALENGKA LINGGARSATI
PELABUHANRATU PADADAROK CIMAHI BANDUNG KUNINGAN
SURANEGARA SOREANG TANJONGEDEK CIRUAS
GARUT
CIHENU CIMALAKA
SINDANGBARANG CIJORU
CIBALONG CIAMIS BANJAR
TASIKMALAYA
PANGLIPUKAN CILAWU PARIGI PANGANDARAN
CISASAN central java

TOTAL AREA
35.377,76 km²
POPULATION
47.379.390
POPULATION DENSITY 1339 people/km²
SEX RATIO 102,75
% POVERTY
(SEPTEMBER)
8,77%
(4.168.110)

HDI 70,05
unemployment rate 8,89%
labor force participation rate 60,65%

GRDP
CURRENT – PRICE –
1.652,59
TRILION RP

Share of sectors in GRDP
❶ manufacturing 42,49%
❷ wholesale & retail, repair of motorcycles 15,15%

WEST KALIMANTAN
INDONESIA
BABYY Tamara 2017

SAMBAS, SINGKAWANG, BENGKAYANG, MEMPAWAH, LANDAK, PONTIANAK, SANGGAU, SEKADAU, SINTANG, KAPUAS HULU, KUBU RAYA, MELAWI, KAYONG UTARA, KETAPANG

TOTAL AREA
146.807 km²
POPULATION
4.861.738
POPULATION DENSITY 33 people/km²
GINI RATIO 0,341

% POVERTY
7,87%
(381.350 人)
unemployment rate 4,23%
labor force participation rate 63,32%

GRDP CURRENT — PRICE —
161,49 Trilion RP
HDI 65,88
Share of sectors in GRDP
1 agriculture, foresty, & fishing 20,22%
2 manufacturing 16,10%

WEST NUSA TENGGARA
INDONESIA
BALI SEA, FLORES SEA
MATARAM, SUMBAWA BESAR
INDONESIA OCEAN
East Nusa Tenggara
BABYY Tamara 2017

TOTAL AREA
20.153,15 km²
POPULATION
4.896.162
SEX RATIO 94,26
% POVERTY
16,07%
(793.776 人)

GRDP CURRENT — PRICE —
116,25 Trilion RP
Share of sectors in GRDP
1 mining 21,83%
2 agriculture 21,33%
3 wholesale & retail, repair of motorcycles 12,41%

unemployment rate 3,94%
labor force participation rate 96,06%
HDI 65,81

WEST PAPUA
INDONESIA
PACIFIC OCEAN
TELAGA, Waigeo Island, Gag Island, Batanta Island, Kofiau Island, Salawati Island, SORONG, MEGA, SAUSAPOR, WEFANI, WARMARE, SAGERIN, GASIM, BRYAMARU, TEMINABUAN, ORANSBARI, WAMURJAM, RAPISUKI, Rumberpon Island, YEMBEKARI, BINTUNI, BABO, BOMBERAI, KOKRS, SUSUNU, KONOKA, FAK-FAK, WENDESI, WASIOR, Roon Island, YENDE, Misool Island, WAIGAMA, KAIMANA, LOBO

TOTAL AREA
99.671,63 km²
POPULATION
893.362
SEX RATIO 111
POPULATION DENSITY 8,96 people/km²
% POVERTY
25,43%
(225.800人)
unemployment rate 7,46%
labor force participation rate 70,05%
HDI 62,21

GRDP CURRENT — PRICE —
66,64 Trilion RP
Share of sectors in GRDP
1 manufacturing 26,40%
2 mining and quarrying 19,13%

BABYY Tamara 2017

D.I.YOGYAKARTA
INDONESIA
central java
KALIURANG, KALIBAWANG, TEMPEL, GIRIMULYO, SLEMAN, YOGYAKARTA, PENGASIH, MULYODAN, KOTA GEDE, PLERED, NGAWEN, WATES, SEWON, PLAYEN, BANTUL, SRANDAKAN, SAMAS, IMOGIRI, WONOSARI, SEMANU, PARANGTRITIS, PANGGANG, RONGKOP

TOTAL AREA
3.185,80 km²
POPULATION
3.720.912.000
POPULATION DENSITY 1.167,97 people/km²
SEX RATIO 97,82

% POVERTY
13,34%
unemployment rate 2,72%
labor force participation rate 71,96

HDI 78,38
GRDP CURRENT — PRICE —
110,09 Trilion RP
Share of sectors in GRDP
1 manufacturing 13,21%
2 agriculture 10,41%

BABYY Tamara 2017

Left infographic:

TOTAL AREA
16.787,18 km²

HDI
63,60

WEST SULAWESI
INDONESIA

POPULATION
1.306.400

POPULATION DENSITY 77 people/km²

SEX RATIO 100,68

% POVERTY
11,19%

unemployment rate 3,33%

GRDP CURRENT — PRICE —
35,97 Trilion RP

Share of sectors in GRDP
① AGRICULTURE 41,30%
② Wholesale & retail, repair of motorcycles 10,41%
③ manufacturing 9,44%

Central Sulawesi Province

South Sulawesi Province

MAKASSAR STRAITS

PASANGKAYU
LANANG
DODA
BUDONG BUDONG
DONDO
KALUMPANG
TANPAPANDANG
MAMUJU
MAMASA
PANGALA
MALABO
MALUNDA
SIDODADI
MAJENE
POLEWALI

BABYY TAMARA 2017

Right infographic:

WEST SUMATERA
INDONESIA

POPULATION
5.259.528

POPULATION DENSITY 124,35 people/km²

annual population growth
1,22%

SEX RATIO
99,05

GRDP CURRENT — PRICE —
195,68 Trilion RP

Share of sectors in GRDP
① AGRICULTURE 24,06%
② Wholesale & retail, repair of motorcycles 14,90%

% POVERTY (september)
7,14%
8,27% rural
5,52% urban

HDI
70,73

UNEMPLOYMENT RATE 5,09%

North Sumatera
KOTANOPAN
LANGUNG
PANTI
TALU
BANGKINANG
AIRBANGIS
LUBUK SIKAPING
PANGKALAN KOTABARU
LABUHAN
MANINJAU
BUKITTINGGI
PAYAKUMBUH
PADANG PANJANG
BATUSANGKAR
PARIAMAN
SAWAHLUNTO
TARING
INDARUNG
SOLOK
MUARA
PADANG
PULAUPUNJUNG
ALAHAN PANJANG
SUKIAN
PAININ
SIBERUT
MUARALABUN
KAMBANG
LUBUKGADANG
SIPORA
INDRAPUR
NORTH BAGAI

riau
jambi
bengkulu

BABYY TAMARA 2017