

BUILDING HEALTHY CITIES



# BUILDING HEALTHY CITIES

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Makassar Data Use and Access Assessment

July 2019



## **Building Healthy Cities**

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# ACRONYMS

Bappeda	City Planning and Development Agency
BHC	Building Healthy Cities
BPJS	<i>Badan Pelaksana Jaminan Sosial</i> (Social Security Administrative Body for Health)
DHIS-2	district health information system version 2
Disdukcapil	Civil and Registration Office
EWARS	Early Warning Alert Response System
ICT	information and communications technology
IOM	International Organization for Migration
JSI	JSI Research & Training Institute, Inc.
KIS	Healthy Indonesia Card
KOMDAT	Data Communication Information System
Kominfo	Communication and Informatics Department
Menkominfo	Ministry of Communication and Information
MOH	Ministry of Health
RT	<i>rukun tetangga</i>
RW	<i>rukun warga</i>
SIGIZI	<i>System Informasi Gizi Terpadu</i> (Nutrition Information System)
SIMRS	hospital management information system
SIKAMASE'TA	Information System For Poor Community Data
SIPPD-BEPPEDA	Makassar City Regional Development Planning Information System
SISRUTE	<i>Sistem Rujukan Terintegrasi</i> (Integrated Referral System)
USAID	United States Agency for International Development





# PREAMBLE: BUILDING HEALTHY CITIES BASELINE ASSESSMENT STRATEGY

Building Healthy Cities (BHC) is a three-year (2017–2020), United States Agency for International Development (USAID)-funded learning project conducted in three cities in India, Indonesia, and Vietnam. Implemented by JSI Research & Training Institute, Inc. with partners International Organization for Migration, Thrive Networks Global, and Urban Institute, with support from Engaging Inquiry, LLC, BHC aims to increase the understanding of the best routes for improving the social determinants of health in urban contexts. In year 1 of this project, BHC is conducting in each city several exploratory data collection activities to inform the approach. The resulting data will be validated and used by city stakeholders to define barriers to implementation, unintended consequences, and key leverage points to improve urban health. Based on the current understanding of Smart City activities and city contexts, BHC has identified questions and data collection approaches best suited to answer them. Figure 1 provides an overview of which questions will be answered by each activity.

Figure 1. Overview of BHC Year 1 Exploratory Assessments

	Secondary Survey Analysis (Quantitative)	Health Needs Assessment (HNA) (Qualitative)	Political Economy Analysis (PEA) (Qualitative)	Data Use Assessment (DUA) (Qualitative)
What are the health needs & burdens?	Included	Included		
What health services are available & to whom?		Included		
Who is underserved by current health & city services?		Included		
How are non-health sectors engaging in building a healthy environment?		Included		
How are health & smart cities being coordinated, managed, and financed?		Included		
Who makes the decisions about coordination, management and financing?			Included	
What is the functionality and equity of the coordination, management and financing systems?			Included	
What is the inter- and intra-sectoral functionality of information systems?				Included
What are the barriers to equitable service provision and a healthy environment within this city and system?		Included	Included	Included
What are the data and information barriers to coordination and management across sectors and actors?				Included
What are the opportunities to improve citizen agency & equity of service provision?			Included	Included

These data are only a beginning. BHC's continual process monitoring will follow changes in the themes emerging from this initial inquiry. These updates will be shared via multiple channels. Please check back on [BHC's webpage](#) for new reports and updates on our cities.

# EXECUTIVE SUMMARY

*Full citations for any secondary data cited in the Executive Summary can be found in the main text of this report.*

Makassar is the capital city of the South Sulawesi Province, Indonesia, with a population of approximately 1.7 million people. This rapidly growing city is known as the “gateway to eastern Indonesia.” It has an area of 176 square kilometers and consists of 15 subdistricts (*kecamatan*) and 153 boroughs (*kelurahan*).

In 2014, the newly elected mayor of Makassar declared the city’s new tagline to be “Makassar Sombere (kind-hearted) and Smart City,” identifying the city as a hospitable place to live. A Smart City Masterplan was developed, detailing Smart City goals for 2019-2024.

Makassar was officially selected as a Smart City in 2017. The objective of the Smart City program is to promote cities that improve the quality of life of its citizens through infrastructure, a clean and sustainable environment, and the application of “smart” solutions, including information and communications technology (ICT).

This Data Use and Access Assessment was conducted in Makassar by JSI Research & Training Institute, Inc. (JSI) and the International Organization for Migration (IOM) as part of the United States Agency for International Development (USAID)-funded Building Healthy Cities (BHC) project. The purpose of this assessment was to understand current access to and use of data and ICT in Makassar, and the role of data in decision-making.

## I. METHODOLOGY

The four key themes pursued in this assessment were:

- Existing data systems.
- Use of data and information systems for city planning.
- Citizen access to data and ICT.
- Barriers to increasing data use.

This formative assessment used qualitative methods, including 23 key informant interviews, four focus group discussions, direct observation of the available data systems, and a desk review. Ethical approval for the study was obtained from the institutional review boards at JSI in Boston, Massachusetts, United States, and the Public Health Faculty of Hasanuddin University in Makassar, Indonesia. Data collection took place in Makassar in August 2018, and preliminary data were validated in a multisectoral workshop in September 2018.

## II. RESULTS

### Existing data systems

Smart City initiatives have been implemented in Makassar since 2014, and have used ICT to improve public services. To achieve this goal, Makassar has developed real-time data collection systems for decision-making. Real-time data from a variety of data collection systems and sectors were displayed in the mayor's office on a large monitor, named the war room dashboard. Data address areas such as transportation, road safety and related crimes, public services, and government services such as Home Care health vans. While the war room facilities effectively monitored several public services in real time, there was still no clear policy on which public services should be displayed on the dashboard. Information from the Communication and Informatics Department (Kominfo) mentioned that the next phase of planning will aim to integrate data from several other departments and serve as a data-based decision-making center.

Existing data systems in Makassar were initiated by each sector, with support from Kominfo to build each system. The city has developed the Call Center 112, a channel for people to submit complaints to the city; Makassar City Regional Development Planning Information System (SIPPD-BEPEDA), an integrated system for planning processes; and smart rukun tetangga/rukun warga (small communities) (RT/RW) reporting system for the neighborhood level.

The health office has built its own systems. Some systems were initiated and/or mandated by the central government, such as:

- KOMDAT (Data Communication Information System) platform, an integrated national health dashboard for health status indicators, coverage of service providers, determinants of health, and human resources.
- District health information system (DHIS-2).
- SIKDA Generik app that improves data reporting and recording systems in community health centers.
- *Sigizi Terpadu* (SIGIZI), a platform for nutrition-related data.
- Early Warning Alert Response System (EWARS).
- Sistem Rujukan Terintegrasi (SISRUTE), an integrated referral system.

At the municipal level, the city health office also has developed systems including the Home Care program, telemedicine, SIMRS (hospital management information system), and eHospital.

Other sectors also initiated their own systems such as Kucataki, a Population and Civil Registry Service app for reporting population data; smart Panakukang, an app for waste management; and Pasikola, a transportation department app for tracking vehicles for students and for communicating with drivers.

## Use of data and information systems for city planning

In terms of planning and budgeting, the City Planning and Development Agency (Bappeda) coordinates all department programs. Based on citizen feedback through the “musrenbang” or bottom-up planning process (in this context from village level to city level) and existing data sectors, Bappeda coordinates prioritized programs each year.

The Health Office is responsible for health development planning, using data from various sources and citizen feedback. Data sources include health care facilities and DHIS-2 dashboard. Completed program plans and budgets are submitted to Bappeda.

As the lead offices on the Smart City initiative, Bappeda and Kominfo aim to integrate data from all sectors into the war room dashboard. Some department data are shared with the war room dashboard, including population data from the civil registration office, DHIS-2 data from the health office, real-time drug distribution data, the number of hospital beds available, the number of queues at clinics from city hospitals, data from the Regional Office of Manpower, trade data, and data from the Environmental Office. In the future, all sectors will be encouraged to share their data with the war room dashboard. With a web-based system, the war room will easily draw out the data needed.

Ideally, the war room dashboard will be used to release information for government decision-makers, but also for the public to scrutinize government actions, to engage in decision-making processes, and to improve decision-making overall.

## Citizen access to data and ICT

Access to data and ICT varied based on geographic area and socioeconomic background.

Access to ICT was limited among residents living in slum areas and from low-income families. Mobile phones were typically used for personal communication, and were rarely used to find information and public services. Face-to-face meetings were preferred. Informal leaders, such as the heads of RT/RWs were the main source of information about public services. Information about health and other public services was most often obtained through health post (*posyandu*) workers, community leaders (RT/RW), or information disseminated through mosques. For those with televisions, three local channels provided information about Makassar, namely Fajar TV, Celebes TV, and TVRI South Sulawesi. Local newspapers Koran Fajar and Tribun Timur were another source of information.

Middle-income respondents preferred face-to-face communication. Mobile phones and internet-based platforms were commonly used for communication and to access public services. They used Google, YouTube or social media sites such as Facebook, WhatsApp, and Instagram as well as online news sites. This group stated that they were able to access the information that they need, especially about health and other public services. In addition, free Wi-Fi was available in their offices, which provided

good internet access. Information about health and public services also was obtained from television, health workers, and community meetings.

There are 12 islands in Makassar, 10 of which are inhabited. In remote areas, such as Langkai Island, which is two hours by boat from Makassar, basic infrastructure including information technology, phone signal, electricity, health care, and water installation were not sufficiently available. People living on the island placed signal boosters on their phones to access information from television, radio, and mobile phones.

## Barriers to increasing data use

Each department or office requires data-sharing from other related sectors for planning purposes. For example, Bappeda manages an integrated database system, which requires data from education, social, cultural, and health sectors.

Barriers in cross-sectoral coordination and data management included regulation, lack of human resources, and lack of budget and data management.

There was no universal policy in place that required every department to share its data with the war room dashboard. Each department developed its own data sharing policies, and therefore very different processes for accessing data.

An open data platform was developed for cross-sector data sharing, but barriers to using that data remain. Published data can be downloaded from that platform, while unpublished and confidential data must be requested by letter and delivered by hand. Each department has information management officials who manage data and information requests, including those from the general public.

Data collected and processed by departments were analyzed mostly using Excel. Most departments lacked data analysts with the skills needed to conduct detailed data analysis, resulting in only cursory analysis and data visualization, and poor planning with little specific information.

In addition, barriers existed for the communities in assessing ICT such as poor signal availability, limited access to smartphones, and unreliable electricity.

## III. KNOWLEDGE GAPS

Based on the assessment findings, the following were identified as knowledge gaps for further investigation and planning:

- Data systems and integration with private sectors.
- Data-sharing policy across sectors.
- Role of the war room dashboard in city planning.

Further investigation is needed to fill these knowledge gaps.

## IV. CONCLUSIONS

As Makassar realizes its vision to be a world class, livable city for all, it is important to ensure that data are used for effective and efficient planning. Findings from this assessment can be used to help Makassar reach its goal. The war room dashboard is an opportunity for Makassar to visualize data from all sectors, but ensuring all sectors share their data was a challenge. The mayor also encouraged more innovation, including e-governance, to improve public service quality. However, in some sectors, workforce capacity for managing technology-based innovation was limited. Resident awareness and capacity in using ICT for better public services was another barrier. The findings from this assessment will be triangulated with findings from BHC's other studies examining the health needs and political economy for Makassar residents. This information will help the city government assess vulnerabilities, barriers, and opportunities for improvement.

# 1. INTRODUCTION

Makassar is the capital city of South Sulawesi Province, Indonesia, with a population of approximately 1.7 million people. This rapidly growing city is also known as the “gateway to eastern Indonesia.” The city has an area of 176 square kilometers and consists of 15 subdistricts (*kecamatan*) and 153 boroughs (*kelurahan*). Makassar is one of the most densely populated cities in Indonesia, with approximately 10,000 people per square kilometer (Kominfo 2018).

In 2014, the newly elected mayor of Makassar declared the city's new tagline to be “Makassar Sombere (kind-hearted) and Smart City,” identifying the city as a hospitable place to live. A Smart City Masterplan was developed, detailing Smart City goals for 2019-2024 (Kominfo 2017c). Makassar was officially selected as a Smart City in 2017. The objective of the Smart City program is to promote cities that improve the quality of life of its citizens through infrastructure, a clean and sustainable environment, and the application of “smart” solutions, including information and communications technology (ICT) (Rosandya 2017). Box 1 provides more detail about what it means to be a Smart City in Indonesia.

## Box 1. What does it mean to be a Smart City in Indonesia?

In May 2017, the government of Indonesia launched a plan to develop 100 Smart Cities by 2019, starting with 24 cities in the first phase. Smart Cities are expected to leverage information and communications technology to improve the quality of life of citizens through efficient and effective allocation of regional resources, increased public participation and transparency, an increase in non-cash transactions, and improvements in public transportation, waste management, road congestion, pollution, energy, security, data, and information (Rosandya 2017).

There are currently no nationwide regulations, norms, or standards on Smart Cities. Instead, cities are expected to allocate their city budgets for Smart City development as well as raise funds from external donors (Biradavolu, 2018).

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## Makassar Smart City Initiatives

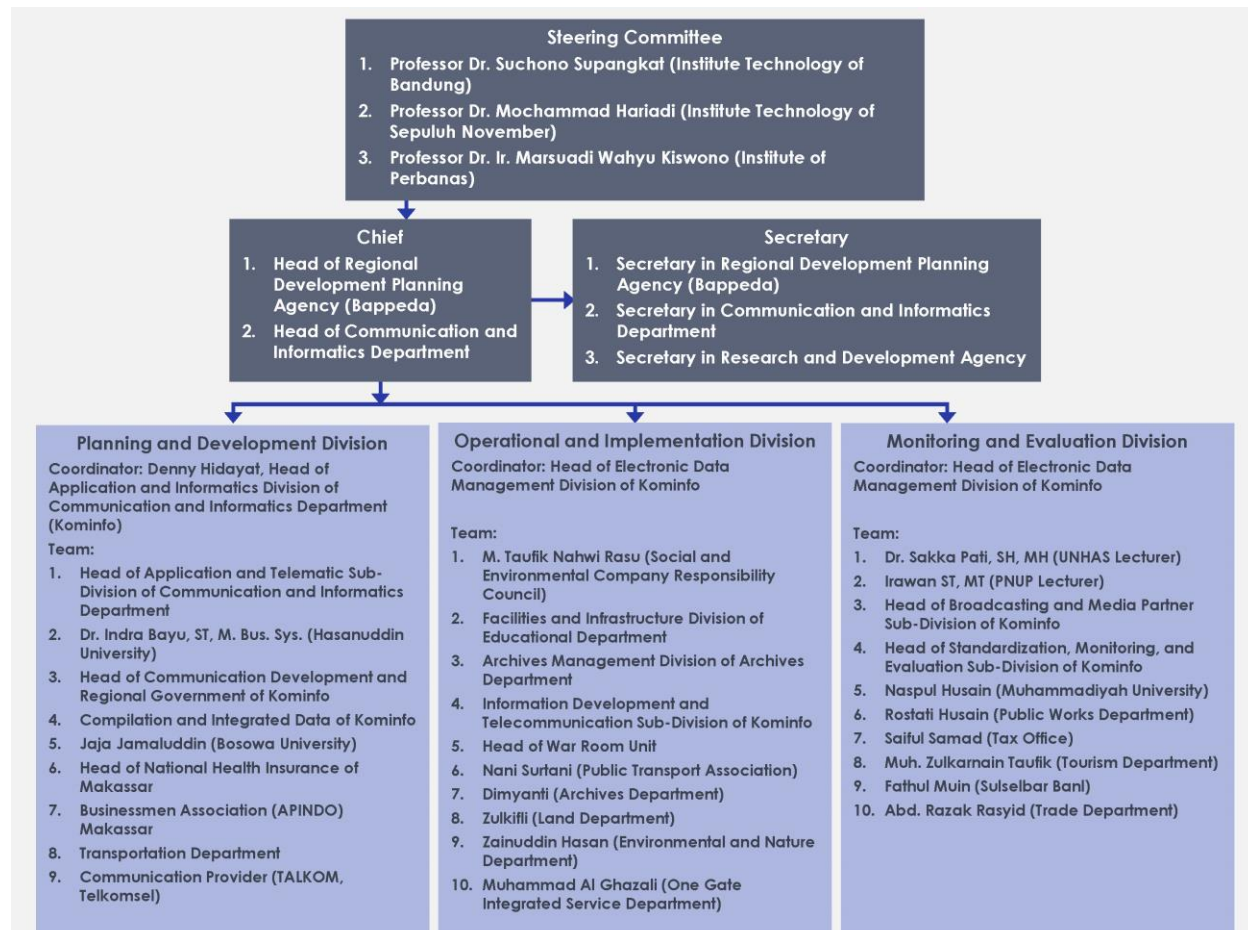
Makassar's vision to be a “world that is comfortable for all” was led by Danny Pomanto, mayor, and Syamsul Rizal, deputy mayor, at the time of this assessment. The Smart City concept is relevant to this goal, as well as South Sulawesi's vision to be the “main pillar



of national development and knot of network" for welfare improvement in 2018 (Kominfo 2017b).

The government of Makassar encourages each department to develop innovative Smart City programs. Departments include their innovation in their budget plan along with routine programs, which are reviewed and approved by the City Planning and Development Agency (Bappeda). Makassar's Smart City initiative also has an implementation team, led by Bappeda and the Communication and Informatics Department (Kominfo), and includes representatives of the private sector and local communities. Figure 2 illustrates the structure of the Smart City implementation team.

Figure 2. Organogram of Smart City Implementation Team



Source: Mayor of Makassar 2017

The Smart City program in Makassar emphasizes various digital services, including web-based system applications to support programs by increasing accessibility and improving public service to the community (Manguluang 2016).

In Makassar, the Smart City concept is linked with the concept of "sombere," a Bahasa Indonesia term meaning "kind-hearted," to create the combined sombere and Smart City philosophy. Sombere is a courtesy behavior in local culture, where hospitality is

provided to everyone, including guests, new acquaintances, or family. Figure 3 provides more detail on the linked philosophy of sombere and Smart City.

Figure 3. Makassar's Philosophy of Sombere and Smart City



Source: Kominfo 2017a

The six dimensions included in Makassar's sombere and Smart City philosophy are described below and shown in Figure 4 (Kominfo 2017c).

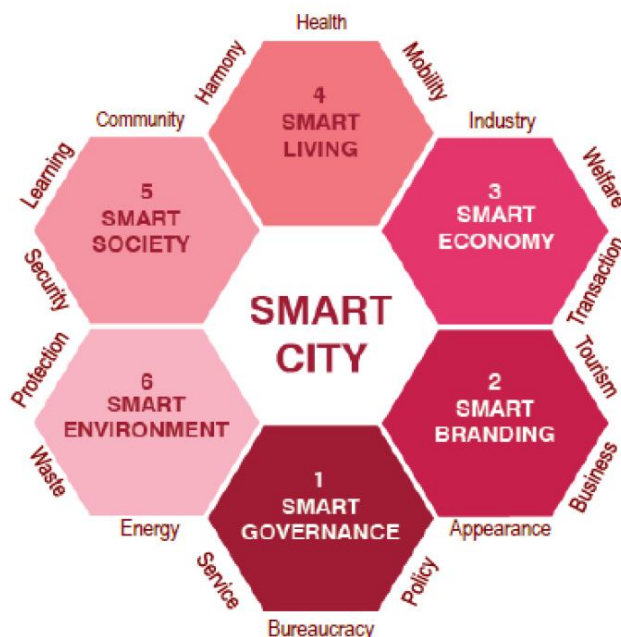
### Smart Governance

The goal of smart governance is to realize more effective, efficient, and communicative governance, and to improve the performance of bureaucracy through innovation and adoption of integrated technology. The adoption of technology can accelerate these changes. Smart governance includes three elements—service, bureaucracy, and policy.

### Smart Branding

Smart branding focuses on innovation in marketing to improve competitiveness by developing three elements—tourism, business, and the physical appearance of the city. The goal is to enhance marketing at local, national, and international levels.

Figure 4. Smart City Dimensions



Source: Kominfo 2017c

### *Smart Economy*

The objective of a smart economy is to create an economic ecosystem that can rapidly adapt to meet a variety of challenges, and to increase the community's financial literacy through various programs such as going cashless. Smart economy focuses on three elements—industrial ecosystem, the improvement of people's welfare, and the ecosystem of financial transactions.

### *Smart Living*

Smart living is determined by three elements—the ability of lifestyle, health quality, and transportation to support mobility within a Smart City.

### *Smart Society*

Smart society places human beings as the central focus of a city. The goal of a smart society is to realize a socio-technical community ecosystem that is humanist and dynamic, to create a productive, communicative, and interactive society with high digital literacy.

### *Smart Environment*

The goal of a smart environment is to give balanced attention to the environmental concerns of sustainable urban development and the physical infrastructure and facilities needed for citizens.

## 2. METHODOLOGY

### I. Selection of Makassar

Makassar, with a population of 1.7 million (as of 2017), is the fifth-largest city in Indonesia. It is a trading center, the most urbanized part of eastern Indonesia, and is the provincial capital of South Sulawesi Island. Nearly half of the economy of South Sulawesi is concentrated in Makassar. McKinsey Global Institute labels Makassar as a “small middleweight city” (urban populations less than 2 million) and among the fastest growing within this category. The city is expected to double its current population by 2030 (Oberman, Raoul et al. 2012). Makassar was chosen by BHC after discussion with the local government, due to its population size, potential for growth, and Smart City activities. Along with Indore, India, and Da Nang, Vietnam, it acts as a project learning site for developing effective urban health interventions.

### II. Assessment Objectives and Scope

BHC is collaborating with Makassar's Smart City initiative to support healthier policies, plans, and services. BHC will support this goal by increasing the availability of data for decision-making, multisectoral collaboration, and the citizen's voice in city processes.

This report presents the findings of a rapid assessment of access to and use of data in Makassar. This will inform the more detailed city workplans relating to data system interoperability and citizen reporting systems in the city. This report covers the following items:

1. *Existing data systems*: What systems are in use for key sectors? What is the inter- and intra-sectoral functionality of those information and data systems? Are new systems being planned to support Smart Cities?
2. *Use of data and information systems for city planning*: How are data and information systems being used for e-governance now? What are the guidelines for data management, coordination, and sharing?
3. *Citizen access to data and ICT*: Do citizens have access to city data and ICT? Is that access or participation equitable? What is their perspective on the security and privacy of those data and ICT platforms? Are mechanisms available for citizens to participate in data collection, analysis, or interpretation? How do citizens communicate via ICT?
4. *Barriers to increasing data use*: What are the barriers to data system interoperability? To system functionality? To citizen use and accessibility?

This report is organized around these key themes.

### III. Data Collection and Analysis

A combination of primary and secondary research approaches were used for this exploratory qualitative assessment. In August 2018, information was gathered using key informant interviews, focus group discussions, direct observation of the available data

systems, and a desk review. Ethical approval for the study was obtained from the institutional review boards at JSI in Boston, Massachusetts, United States, and the Public Health Faculty of Hasanuddin University in Makassar, Indonesia.

Data collection tools were adapted from the MEASURE Evaluation “Tools for Data Demand and Use in the Health Sector” manual and the Cities Alliance report, “An Innovative Data Toolkit for City Management” (MEASURE Evaluation 2011; Cities Alliance 2017).

A total of 23 key informant interviews were conducted with government officials from the health, planning, statistics, environment, ICT, public works, social protection, traffic, transportation, and police departments.

A total of four focus group discussions were conducted with groups of citizens of Makassar from underserved areas, slum areas, and low- and middle- income backgrounds in order to understand their access to available data and information. Each focus group discussion consisted of six to eight participants.

Direct observation was conducted of the war room dashboard, as well as online web-based systems for several departments including health, information and communication, and education. Documents such as health reports also were reviewed.

## Limitations

During data collection, some key informants from government departments were hesitant to provide detailed information due to concerns of confidentiality. In addition, it was difficult to find appropriate respondents in each department due to a complicated permission and administrative process. Focus group discussion participants from communities were reluctant to share information, with only a few talking during interviews. In addition, the number of respondents from communities was relatively small, and therefore did not represent all of Makassar's population. This exploratory assessment is the first step toward understanding the relationship between data producers and users in Makassar; it should not be considered a comprehensive picture of all data use in the city.

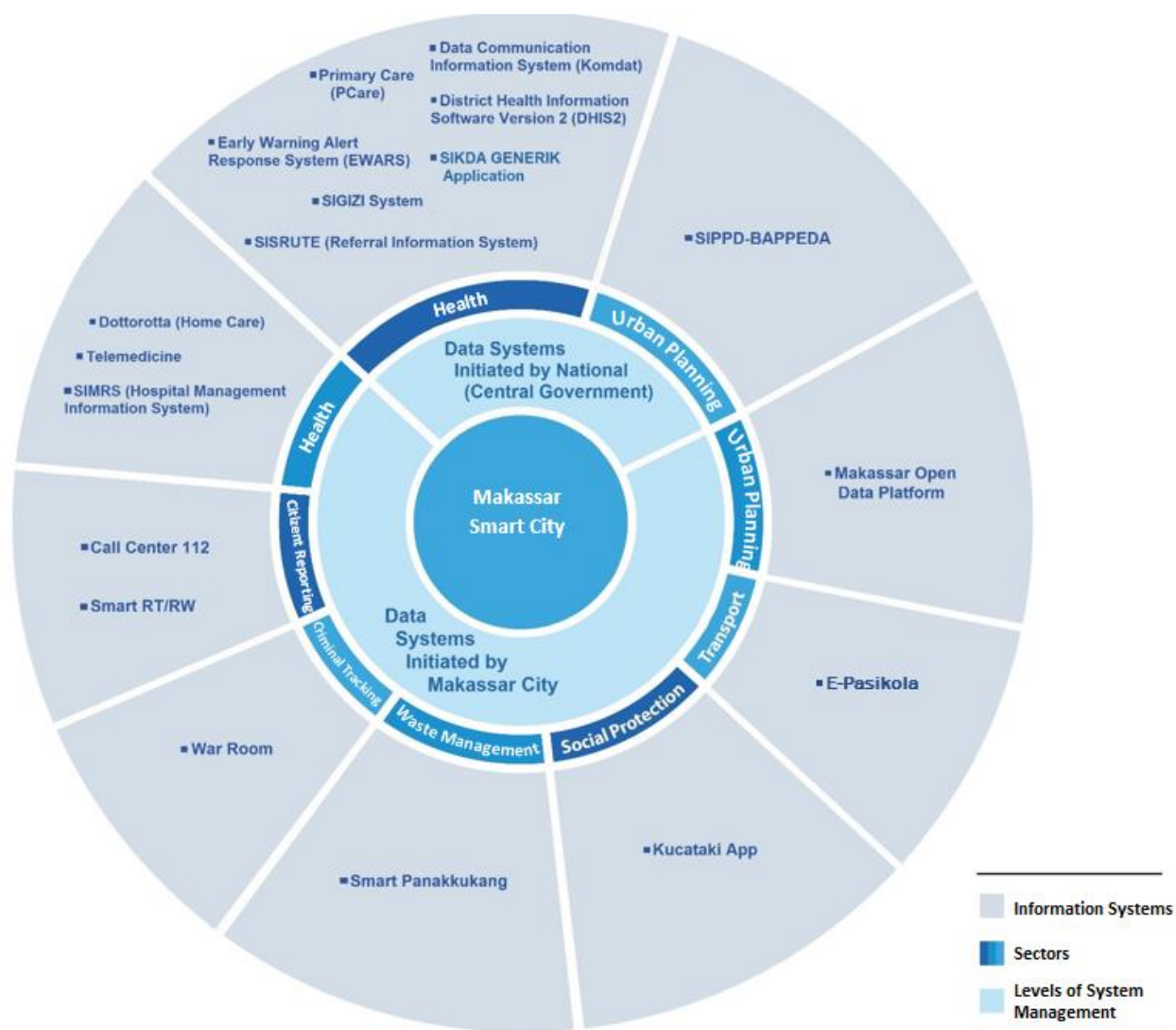


### 3. RESULTS

#### 1. Existing Data Systems

As part of Smart City implementation, the government of Makassar documented existing ICT infrastructure and which data systems would be needed. Figure 5 illustrates the ICT systems found during this assessment, their level of management, and the sector that operates them.

Figure 5. Existing ICT Systems in Makassar



Source: BHC interview data 2018.

At the time of this assessment, Makassar had 36 local servers and 46 public IP servers. Table 1 shows how these servers were distributed across departments (Kominfo 2017a). Ninety-three percent of departments under the Makassar government had an internet

connection, with 73 percent using the Telkom Indonesia provider, a state-owned enterprise providing IT service.

*Table 1. Distribution of Local and Public IP Servers across Departments*

Departments	Number of Servers	
	Local Servers	Public IP Servers
Economic Development Division of City Office	9	2
Governance Division of City Office	5	-
Political Division of City Office	-	1
Small Enterprise Department	2	2
Civil Registration Department	2	30
Environmental Department	2	2
City Revenue Office	10	5
Community Empowerment Body	1	-
City Archives and Library Office	1	1
Integrated Administration Office	1	-
One-stop Integrated Licensing Office	1	-
Subdistrict Office	2	-
Labor Office	-	1
City Civil Service Agency	-	2
<b>Total</b>	<b>36</b>	<b>46</b>

Source: Kominfo 2017a

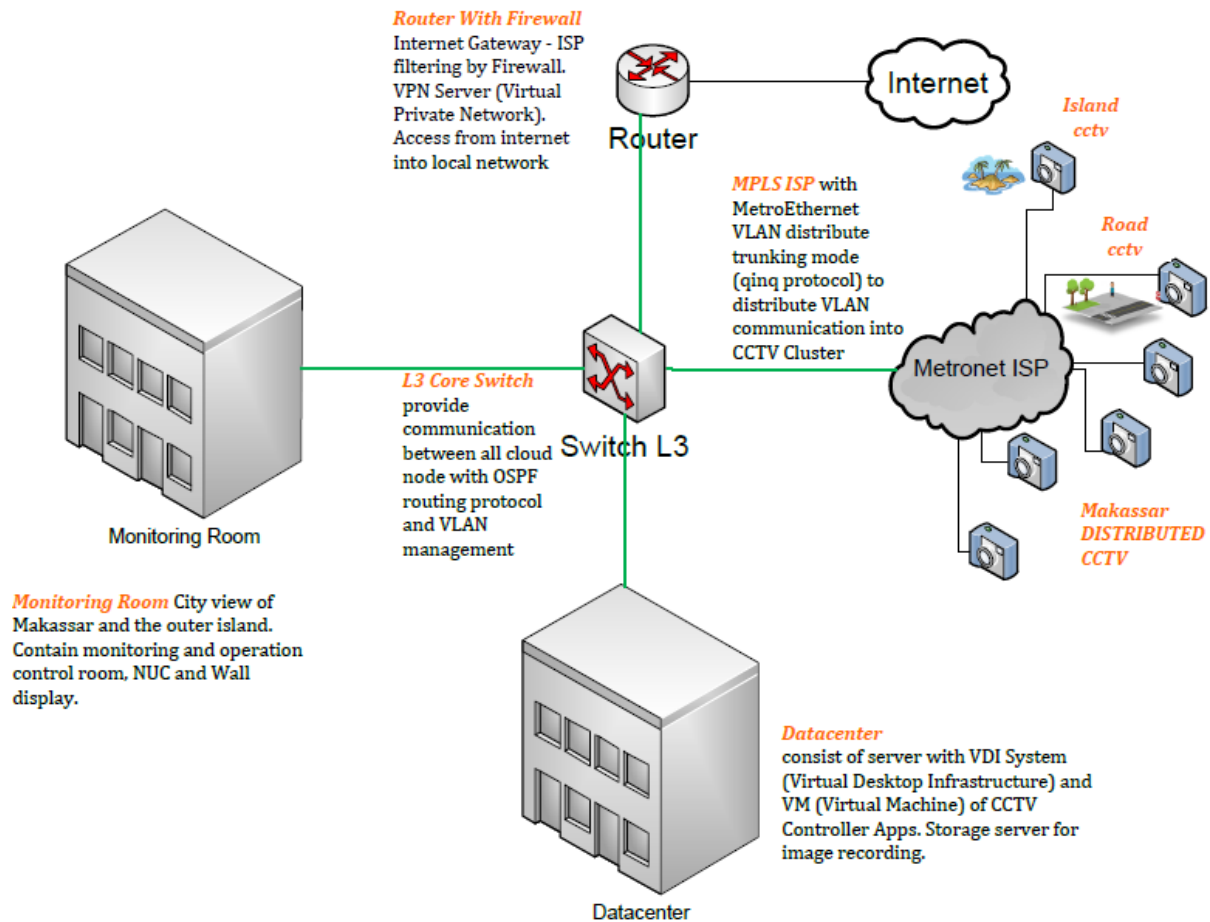
## Overview of Smart City data systems

### *City Operation Room (War Room Dashboard)*

Smart City initiatives have been implemented in Makassar since 2014, and have used ICT to improve public services. To achieve this goal, Makassar developed real-time data collection systems for decision-making. Real-time data from a variety of data collection systems and sectors are displayed in the City Operation Room on a large monitor, known as the war room dashboard.

Initially, the dashboard was developed to monitor transportation and road safety, by drawing from 300 closed-caption televisions 24 hours per day (see Figure 6). High-quality images are used to monitor city security as well as public services and strategic programs in Makassar. This facility has also allowed police officers to monitor accidents and other issues in real time, although the primary purpose has been monitoring traffic and crime along major roads (Ramadhan 2017).

Figure 6. Topology of CCTV Integration into War Room



Source: Kominfo 2017c

The city later expanded the war room dashboard's purpose, using it to monitor public and government services in Makassar. For example, Home Care health program facilities are monitored online and visualized in the war room. While the war room dashboard has been used to effectively monitor several public services in real time, there is no clear policy around which public services should share their data with the dashboard.

In the next phase of development, Kominfo plans to integrate data from several additional departments into the war room, allowing for improved visualization and serving as a data-based decision-making center.

Data from apps developed by other departments also have been integrated into the war room dashboard, including population data, weather and climate monitoring, the DHIS-2, and GPS tracking of all government-owned vehicles. Media analytics data around citizen engagement through social media also are integrated into the dashboard (Abdurrahman 2016a).





War Room Dashboard.  
Photo credit: Afdhal Muh 2018

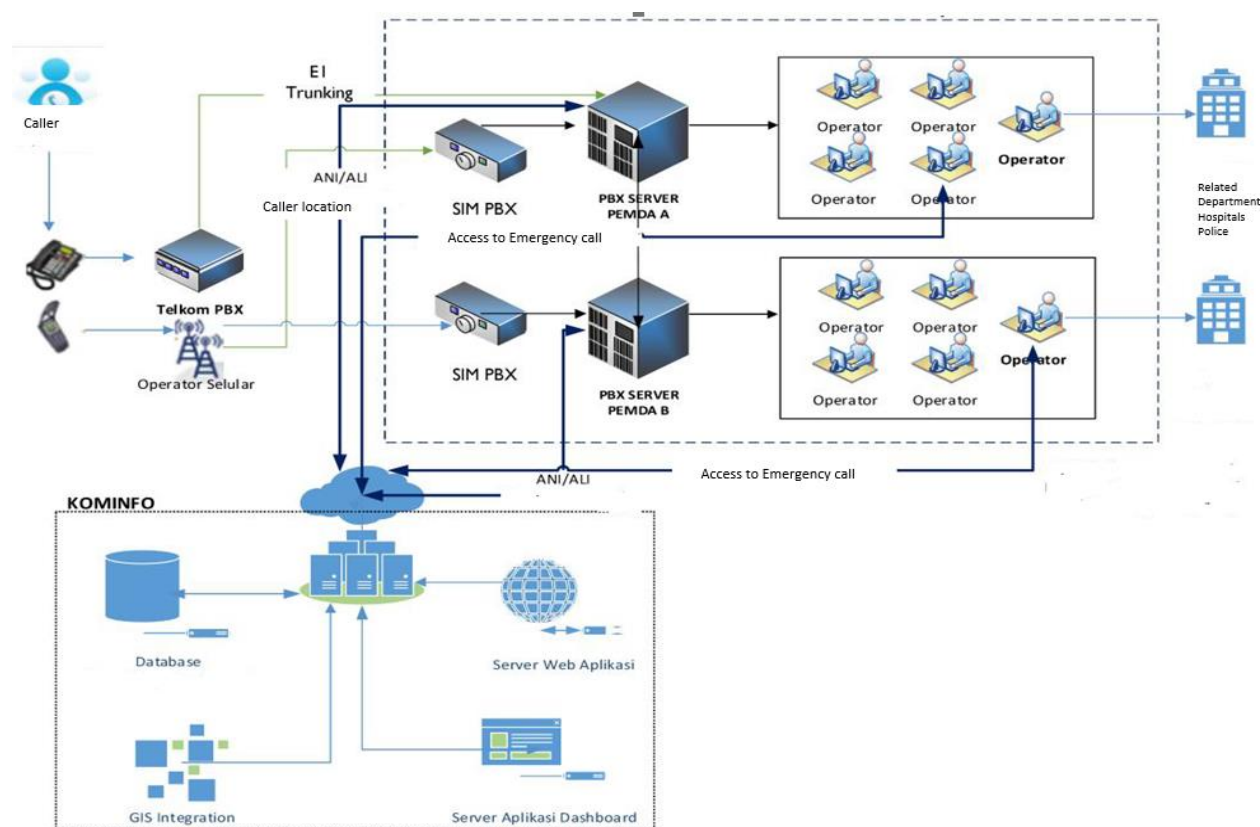
Operation of the war room dashboard follows the design laid out in a 2016 mayoral decree. A technical operational team within Kominfo was formed to serve the following purposes (Mayor of Makassar 2016b):

- Plan, compile, and implement war room programs and activities.
- Carry out war room management and operational administration.
- Monitor, evaluate, and report on war room activities.
- Ensure data and information security.
- Process data center, Call Center 112, network infrastructure management, and other data.

### *Call Center 112*

Call Center 112 is a Ministry of Communication and Information (Menkominfo) pilot program operated in collaboration with the Makassar government. Call center data are integrated into the war room dashboard (Kominfo 2017c). Call Center 112 offers a service through which people can call one number for free to report concerns across a variety of topics, including emergencies, traffic jams, criminal activity, issues with Home Care, waste management, water supply, and electricity, among others. Concerns are then passed on to the specific departments needed to address them. Calls are answered and referred to the appropriate department by 33 officers working in three shifts covering 24 hours (see Figure 7). During interviews for this assessment, city officers claimed that this service responds to calls within 10-15 minutes, while citizens gave a slightly longer response time of 10-20 minutes.

Figure 7. Call Center 112 Flow Chart

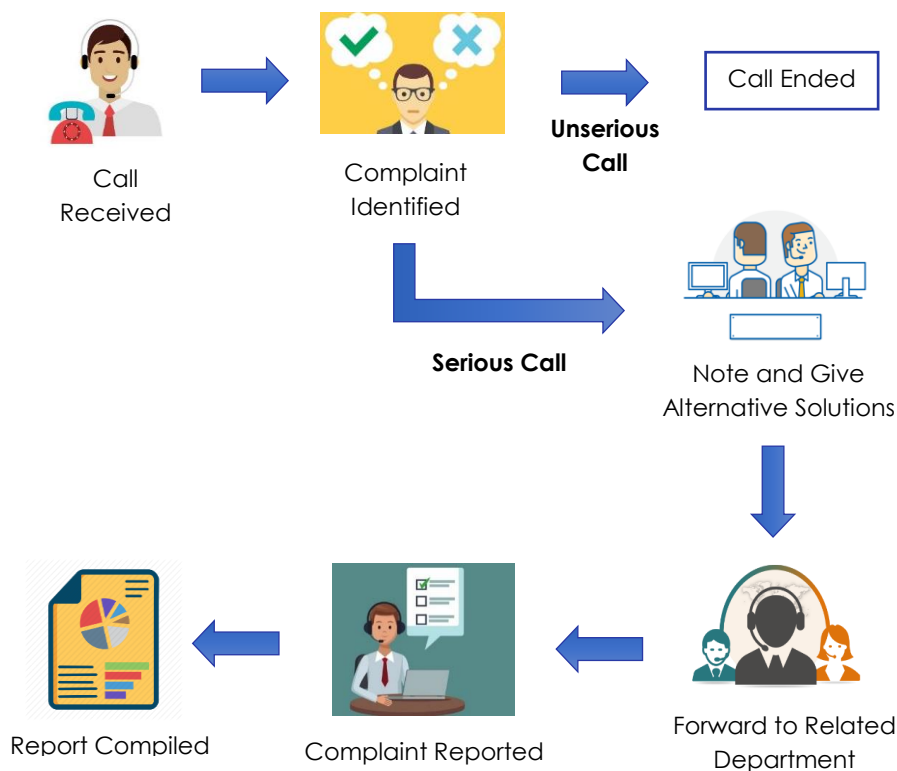


Source: Kominfo 2017c

Officers receive calls, and first determine whether the issue is "serious" or "unserious." Serious calls are defined as calls where the caller stays on the line, and has an issue that needs to be referred to a department in order to be addressed. Unserious calls are defined as calls that do not require follow-up, or present non-urgent situations such as routine testing or silent callers. Officers respond to serious calls by noting the caller's name, and type and description of complaints, and provide a solution if possible. Complaints that cannot be resolved directly are forwarded to the appropriate department(s). Departments then take action and report their responses to the 112 office on a monthly basis (Kominfo 2017d). The Call Center 112 standard operating procedure is described in Figure 8 below.

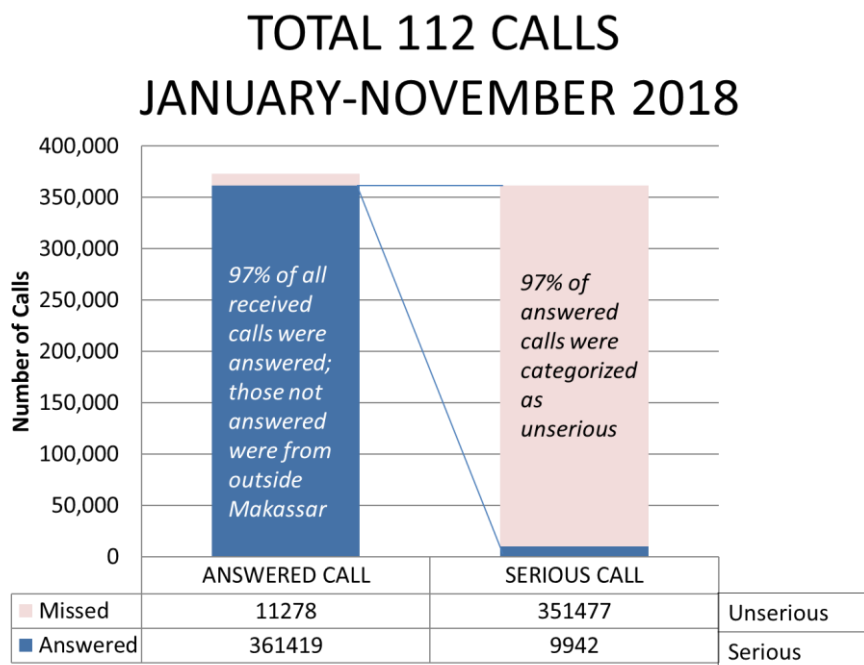
Between January and November 2018, a total of 372,697 calls were received. Of that number, 9,942 calls had been addressed and resolved by relevant departments. The categories of calls are shown in Figure 9 below.

Figure 8. Call Center 112 Standard Operating Procedure



Source: Kominfo 2017d

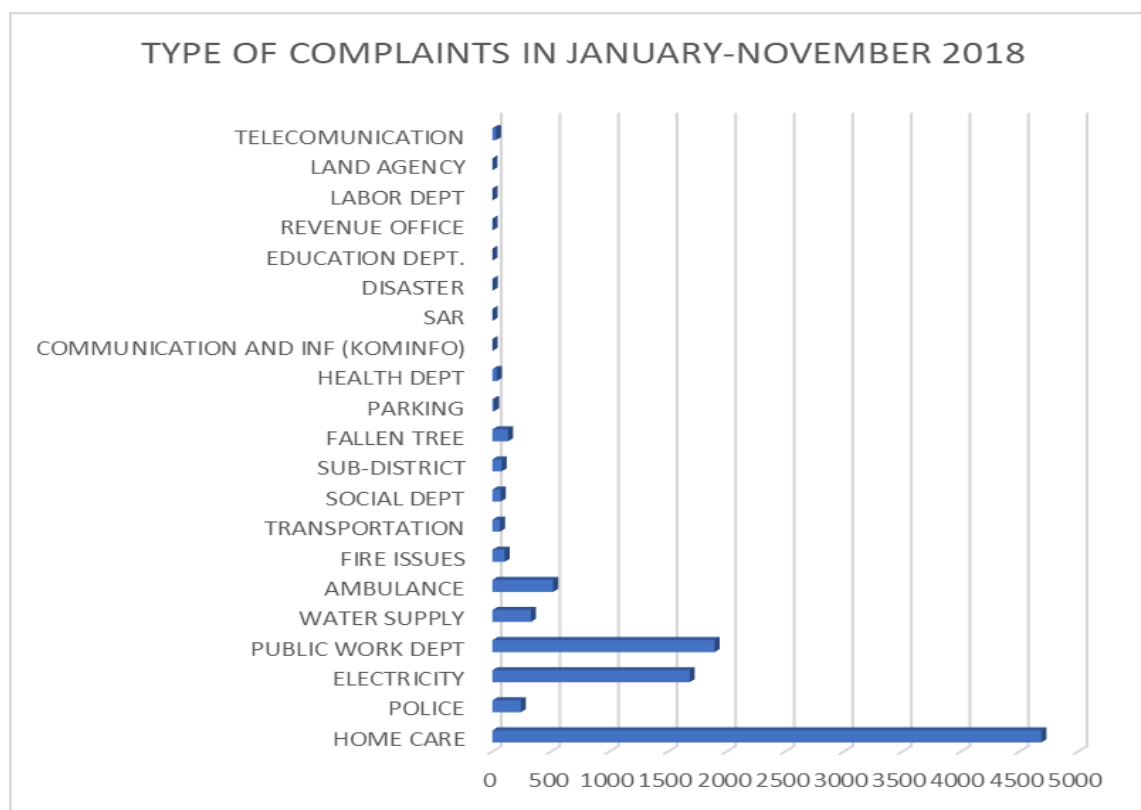
Figure 9. Category of Call Center 112 Calls in 2018



Source: City Operation Room, War Room 2018

The types of complaints received are shown in Figure 10. However, community members interviewed for this assessment mentioned that they were not very familiar with the Call Center 112. Some people were aware of this service, but they believed this phone number was only for emergencies such as fire or medical situations. Village officers interviewed stated that they sometimes discuss the Call Center 112 with their communities.

Figure 10. Type of Complaints Received by Call Center 112 in 2018



Source: City Operation Room, War Room 2018

#### SIPPD-BAPPEDA

The Regional Development Planning Information System (SIPPD-BEPPEDA), operated by Bappeda, links to the national planning agency to synchronize priority programs across national, provincial, district, and city levels. It monitors budget allocation based on program outcomes, and provides an integrated platform for departments across sectors to plan, monitor, and evaluate programs. Input gathered from the community level through the musrenbang, or bottom-up planning process, is also managed through this system (Agung, Haerul, and Moh 2016).

A number of trainings have been conducted to familiarize village and subdistrict officers with operating SIPPD-BAPPEDA (Bappeda Kota Makassar 2016). This has improved transparency around the selection of community proposals, and has led to increased quality of development planning.

## SIKAMASE'TA

Information System for Poor Community Data (SIKAMASE'TA) is a system developed by the Makassar government to facilitate data verification, validation, and synchronization for poor communities in order to reduce poverty in the city (Bappeda 2018).

SIKAMASE'TA ensures accurate and up-to-date data on those communities, registering people with a name, address, and picture. Outputs from this system include descriptive data on poor communities categorized in four clusters: property ownership, assets, enrollment in poverty programs, and socioeconomic status (Syam 2018) (See Figure 11).

Figure 11. SIKAMASE'TA Display



Source: Bappeda 2018

## Smart RT/RW

Rukun tetangga (RT) and rukun warga (RW) are small community divisions of territory in Indonesia. RT is the smallest division, comprising up to 30 households in rural areas, or 50 households in urban areas. Three to five RTs are then combined to make up a RW. RTs and RWs are similar to social organizations, with the purpose of maintaining and preserving the values of Indonesian social life, including working together and valuing family, and supporting development at the village level (Yanuardi 2015).

Smart RT/RW is an app that supports collaboration between RT/RW leaders, citizens, government boards, and other related institutions to deliver better public services. It is a platform to routinely report development progress at the neighborhood level (see Figure 12). More than 8,000 users have installed this app. However, during an interview

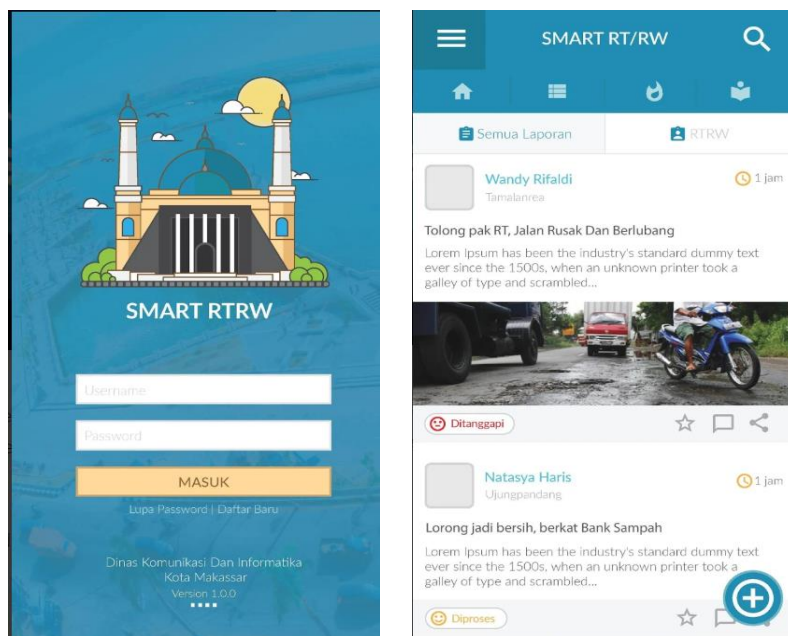


with RT/RW leaders it was mentioned that due to technical problems, they prefer to use WhatsApp for reporting instead.

Smart RT/RW monitors nine indicators for regular reports (Riyadi 2019):

1. *Lorong Garden* (Garden Alley): Number of garden alleys built, measured in terms of length and number. This indicator is documented through a photo of the alley's condition with a percentage of completeness ranging from 0-100 percent.
2. *Makassar Tidak Rantasa* (Makassar Clean City): The extent to which residents obey the local government's schedule of garbage collection and drainage cleaning, and the extent to which hawkers obey rules around where they can gather.
3. *Bank Sampah* (Garbage Bank): The extent to which household waste is sorted and the number of residents/households registered as garbage bank customers.
4. *Retribusi Sampah* (Garbage Collection Fee): The garbage collection fees and the target total amount to be collected.
5. *Pajak Bumi Dan Bangunan* (Tax): Availability of tax data and whether tax targets for the year have been reached.
6. *Sombere* (Hospitality): Number of meetings, services, study groups, and religious meetings each month. Also includes community security patrol schedules and the level of citizen compliance with those patrol schedules.
7. *Smart Card*: Whether the RT/RW leader has a smart card and the level of interest of residents in smart cards.
8. *Administration of RT/RW*: Availability of 12 administrative record books for RT/RW leaders, number of books, and completeness of the filling/recording process.
9. *Control Social Activity*: Citizen compliance and non-compliance with activities as monitored by RT/RW leaders.

Figure 12. Smart RT/RW Display



Source: Kominfo 2017e

## Health sector data systems overview

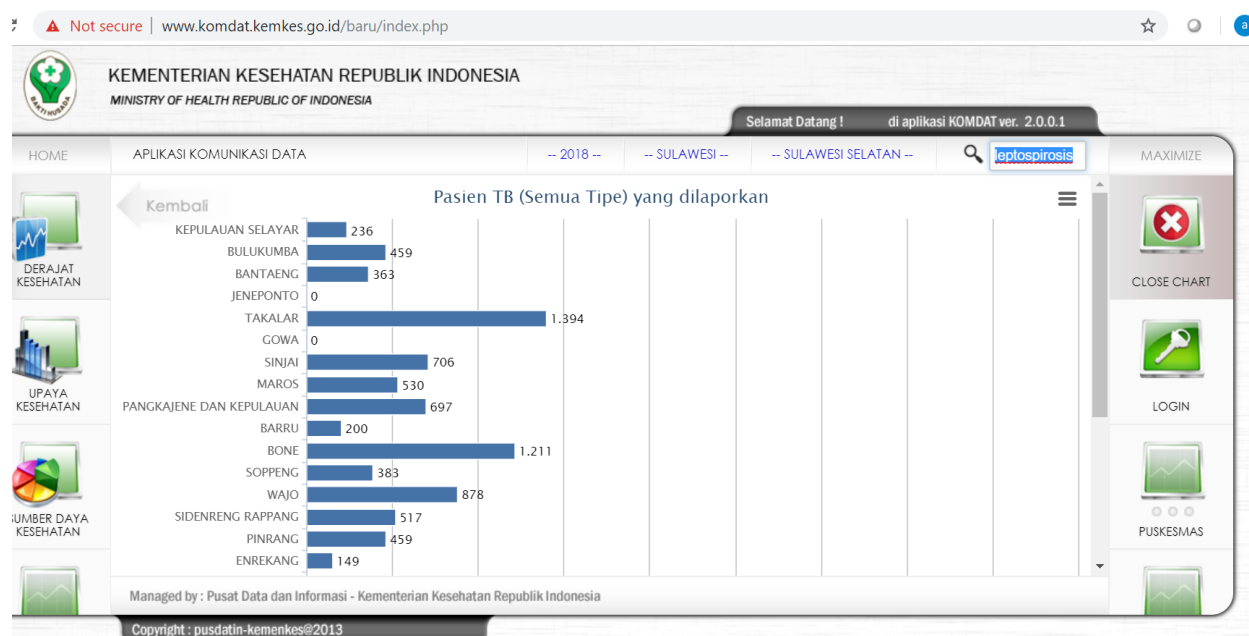
Several web-based systems for health data storage, visualization, and communication have been developed under the Ministry of Health (MOH) for routine data collection. Most health programs have their own independent data reporting system. These include the *System Informasi Terpadu TB* (Integrated Tuberculosis Information System), HIV/AIDS Information system, and *System Informasi Gizi Terpadu* (Nutrition Information System) (SIGIZI), among others. These web-based systems, however, are password protected and were design for each individual program. The data are not accessible to those outside the program, including health workers. In most cases, a specific person is authorized to access the system, and that person conducts data entry and analysis. It appeared that those web-based information systems are primarily intended to send data from districts to the health ministries or provincial health offices.

## National health programs

### *Data Communication Information System (KOMDAT)*

The MOH's recently developed Data Communication Information System (KOMDAT) allows district health offices in Indonesia, including Makassar, to regularly submit their data on key health indicators such as health status, service coverage, determinants of health, and human resources for health. The platform serves as a dashboard and visualizes data at both the national and district level (see Figure 13).

Figure 13. KOMDAT Display



Source: Data and Information Center, Ministry of Health 2019

## DHIS-2

In 2017, the Makassar Health Office adopted DHIS version 2 (DHIS-2) in order to integrate various health information systems at the district level. DHIS-2 is an open-source Java-based software developed to support data collection, reporting, and dissemination for health programs. It integrates various health systems data and is able to provide data in tables, graphs, and maps in a dashboard. This software is password-protected and is not yet publicly available.

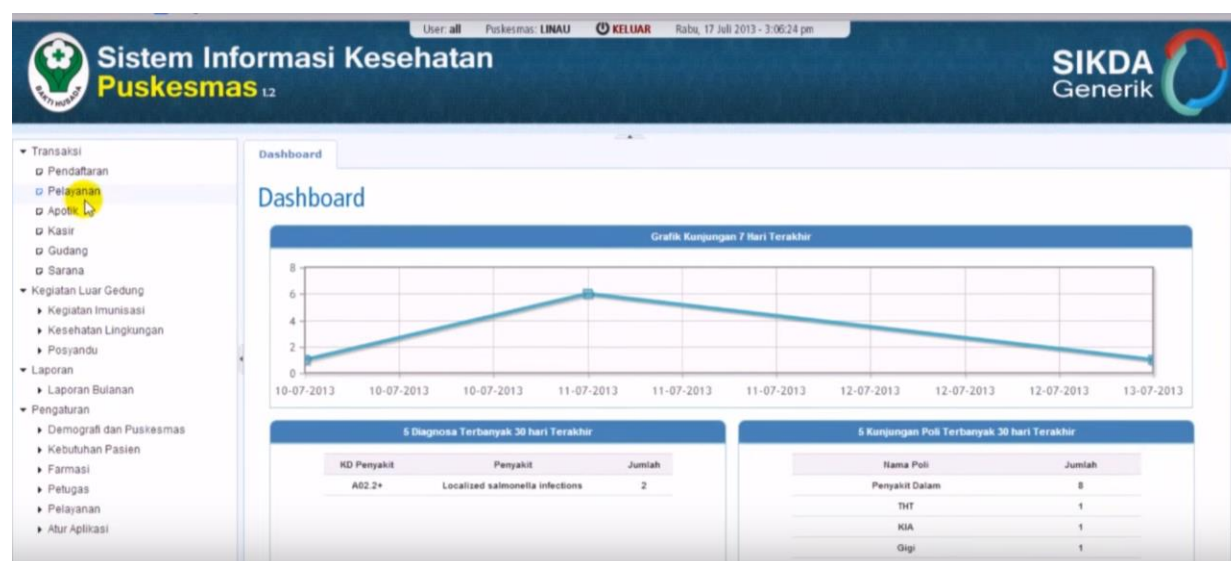
The integration function of DHIS-2 might be used in the future to integrate health data from other sources, such as health care facilities from central, province, and district levels (Data and Information Center, Ministry of Health 2018).

## SIKDA Generik Application

At the time of this assessment, the Makassar District Health Office had recently begun using SIKDA Generik. This system was developed by the MOH Centre for Health Information to be used by district and provincial health departments, and public and private health facilities such as community health centers (puskesmas), hospitals, or clinics. The application standardizes health information systems across levels of health facilities (see Figure 14).

While this application will improve data reporting and recording systems, it requires a good ICT infrastructure such as computers and internet facilities, which may not be found at puskesmas. Highly trained health staff also are required to ensure this application works. The Makassar District Health Office has committed to use this application at puskesmas and has proposed a budget to the local government to invest in ICT infrastructure and training for health staff. SIKDA Generik will facilitate reporting from puskesmas officers and increase the quality of data for decision-making.

Figure 14. SIKDA Generik Display



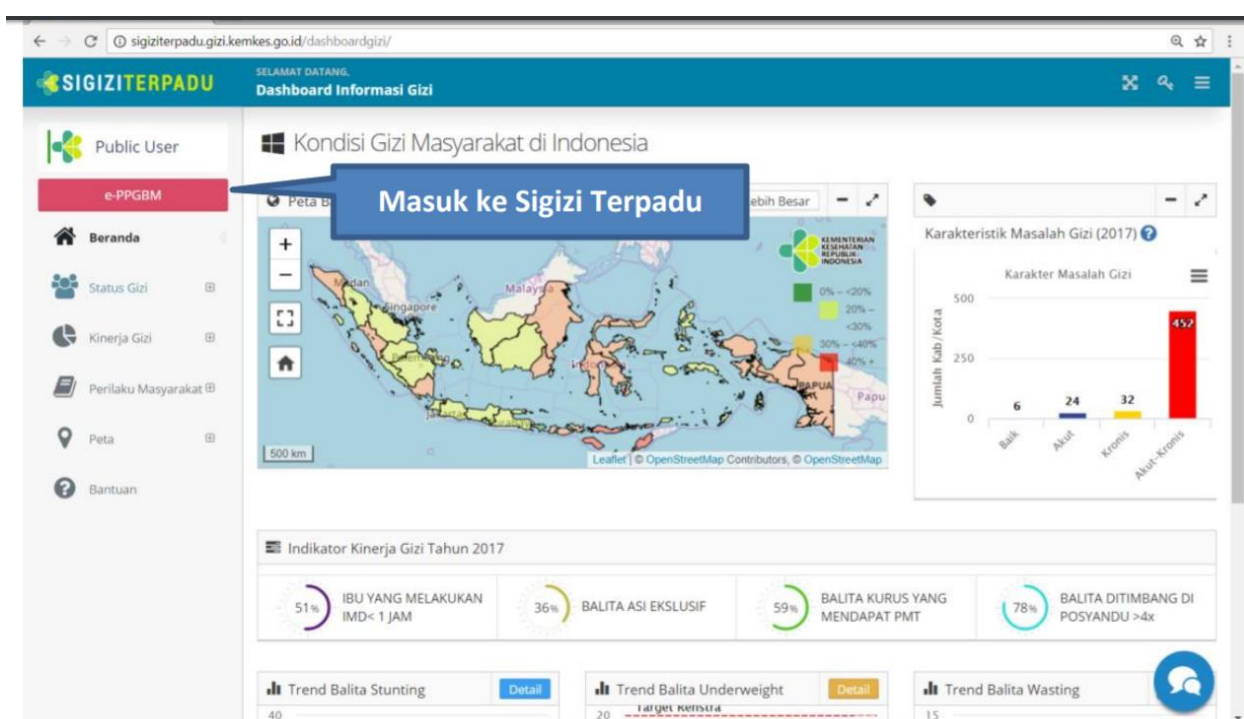
Source: Luthfi 2015



## SIGIZI

The MOH-developed SIGIZI is an integrated nutrition information system used to determine nutrition status and program performance. Implemented nationally, SIGIZI records and reports nutrition-related data such as nutritional status, supplement distribution for children, and budget figures. The system comprises modules for specific purposes including recording and reporting community based-nutrition (e-PPGBM, available both online and offline), recording supplement distribution (PMT module), routine nutrition reporting, and data management (see Figure 15). SIGIZI enables programs to obtain individual target data, to provide accurate routine nutritional status information, to provide data on malnutrition treatment and referrals, to monitor toddlers' growth, and to monitor supplemental feeding (Ministry of Health 2017).

Figure 15. Sigizi Display



Source: Ministry of Health 2017

## Early Warning Alert Response System

The Early Warning Alert Response System (EWARS) is a network-based computer program used to monitor infectious disease and signal if the number of cases exceeds a certain level (see Figure 16).

The MOH has operated EWARS since 2009. This system is very helpful for surveillance programs in detecting an outbreak, as well as delivering a quick response. Outbreak detection is based on routine surveillance reports from puskesmas as well as district, provincial, and national levels (Wahyuni, Sidik, and Wahiduddin 2013).

Figure 16. EWARS Dashboard



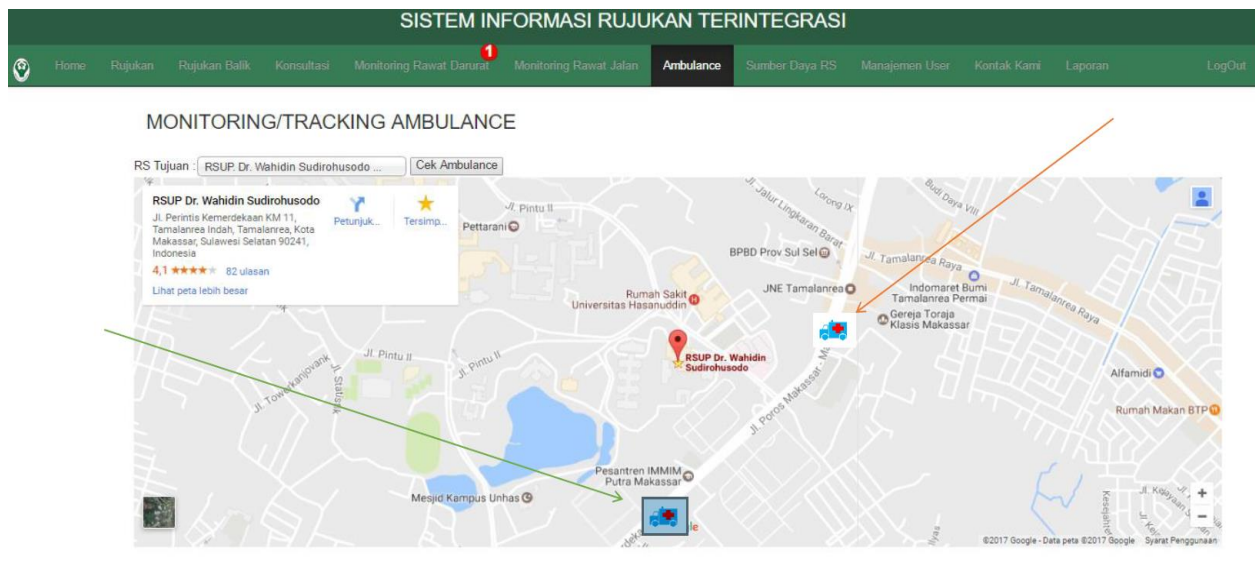
Source: Dinas Kesehatan Provinsi Sumatra Utara 2017

### SISRUTE

SISRUTE (Sistem Rujukan Terintegrasi, Integrated Referral System), available at [sisrute.kemkes.go.id](http://sisrute.kemkes.go.id), is an internet-based service that connects patient data from primary health services to higher services (horizontal and vertical) aimed at simplifying and accelerating referral processes (Ministry of Health 2012).

At the time of this assessment, approximately 840 health facilities had implemented this integrated referral information system, including the City Hospital of Makassar. Before processing a referral, hospital staff must check whether specific resources are available, including medical devices, blood, beds, and human resources (especially doctors). This information is provided through SISRUTE in real time. The patient's medical history also is available, including any treatments and referrals they have received in the past (Hosodo 2016). Figure 17 shows a data display from SISRUTE tracking ambulance ability for referrals to another hospital.

Figure 17. SISROUTE Ambulance Tracking



Source: Saleh 2019

### PCare

Primary Care (PCare) is a web-based, password-protected patient service information system application provided by Indonesia Health Insurance Company (BPJS) for health facilities (see Figure 18). It is similar to hospital medical record systems, collecting information on patients covered by BPJS, including registration, diagnosis, therapy, and laboratory services. Launched 2014, PCare is operated by all puskesmas in Indonesia ("Aplikasi PCare BPJS Kesehatan Online Untuk Puskesmas" 2016). It offers two categories of data collection:

- Patient registration, in which data entry is carried out by registration officers in puskesmas.
- Patient services, in which data entry is carried out by doctors or other medical center staff. A referral system is also provided for other health facilities covered by BPJS.

Figure 18. PCare Display

The screenshot shows the PCare application interface. The left sidebar contains registration fields for patient type (BPJS/Umum), card type (No Kartu/NIK), and various personal details. The right section displays a table of patients registered on 02/01/2014.

No	No. KARTU	NAMA PESERTA	SEX	USIA	POLI	STATUS	HAPUS
1	0000360328476	DIMAS FILKRI	L	13	Umum	Sudah dilayani	
2	000032891769	ENNY NERIANA	P	43	Umum	Sudah dilayani	
3	000033266487	TJIK OLAH	L	72	Umum	Sudah dilayani	
4	0000360679915	SUBALI	L	69	Umum	Sudah dilayani	
5	0000997651798	HENDRO SUGANDI	L	35	Umum	Sudah dilayani	
6	0000360664233	RENATA SUWANDI	P	8	Umum	Sudah dilayani	
7	0000359846335	AIDIL RIFAI	L	15	Umum	Sudah dilayani	
8	0000360350065	RUSLIANSYAH	L	50	Umum	Sudah dilayani	
9	0000360021453	ANA LULUK JAHNAH	P	19	Umum	Sudah dilayani	
10	0000360478765	KARTEM	P	60	Umum	Sudah dilayani	
11	0000359778993	SALEBAH	P	27	Diagi	Sudah dilayani	

Source: "Aplikasi PCare BPJS Kesehatan Online Untuk Puskesmas]" 2016

## Makassar health data systems

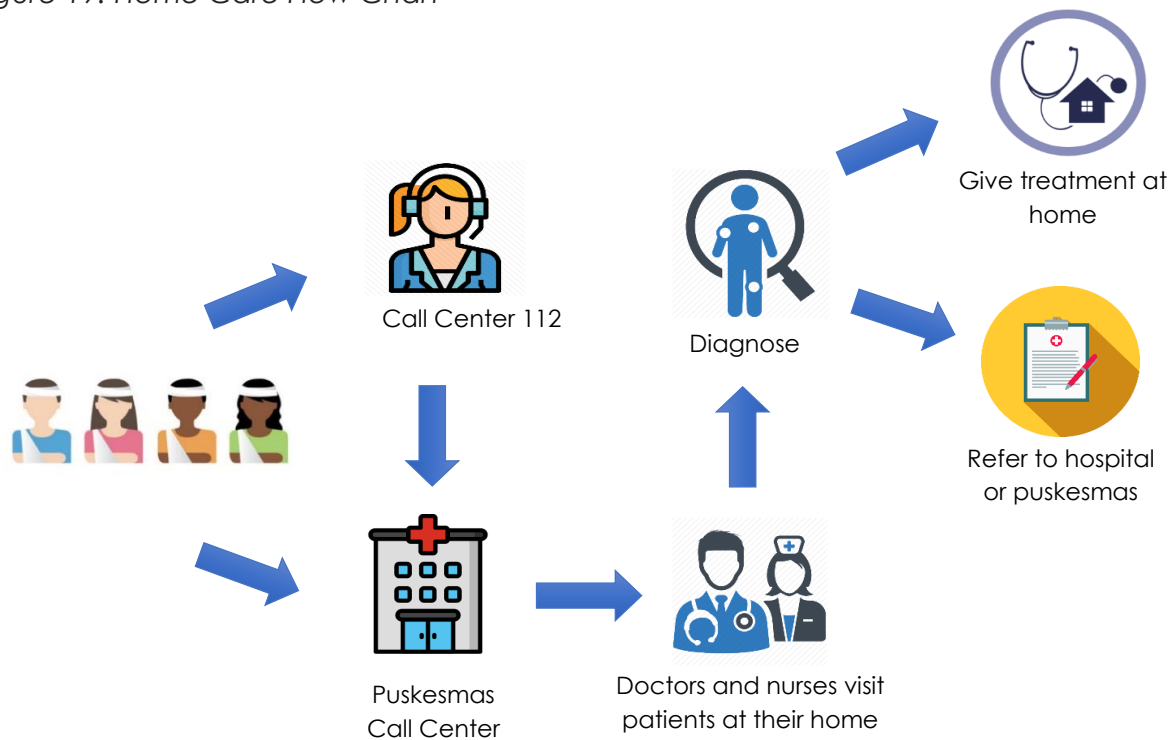
### Home Care (*Dottoro'ta*)

In February 2016, under the Smart City program, the government of Makassar established a program called Home Care (*Dottoro'ta*), operated through the Call Center 112. Home Care provides 24-hour comprehensive health services for individuals and families at their home both as a convenience and to minimize the impact of disease. Home Care officers provide services out of mini ambulances equipped with GPS. Research has shown the Home Care program to be effective for reaching the community with health services (Haeriyawati 2018; Azis, Palu, and Ahri 2018) and that community members are satisfied with the quality of services. Almost half of those interviewed for this assessment stated that the time it took Home Care services to arrive at community houses was relatively fast, less than 15 minutes.

A coordinator from each puskesmas is responsible for running this service in their area with support from a doctor, nurse, and other health workers. To access this service, people contact the Call Center 112 or the puskesmas call center in their area. The Call Center 112 forwards the information to the puskesmas, which dispatches the Home Care officers. Officers diagnose whether the patient can be treated at home or should be referred to the puskesmas (Mayor of Makassar 2016a). Figure 19 shows the progression of Home Care from the initial call, to provision of care. At the time of this assessment, there were 48 Home Care units available in Makassar.



Figure 19. Home Care Flow Chart



Source: Figure created by BHC based on Mayor of Makassar 2016a



Home Care van.  
Photo credit: BHC Makassar

## Telemedicine

The World Health Organization broadly defines telemedicine as:

*“The delivery of health care services, where distance is a critical factor, by all health care professionals using information and communication technologies for the exchange of valid information for diagnosis, treatment and prevention of disease and injuries, research and evaluation, and for the continuing education of health care providers, all in the interests of advancing the health of individuals and their communities” (World Health Organization 1998).*

Telemedicine is particularly beneficial for rural and underserved communities in Makassar, such as those living on the 10 inhabited islands—groups that traditionally suffer from lack of access to health care. This service was launched in 2015 and helps specialist doctors to diagnose cases in remote areas supported by Home Care doctors or nurses/midwives in the puskesmas. It uses the following devices to collect diagnostic information: tele-electrocardiogram for heart issues, tele-ultrasound for pregnancy and internal disease, and tele-spirometry for respiratory issues. Midwives and nurses have been trained to operate these devices (Azikin 2016).

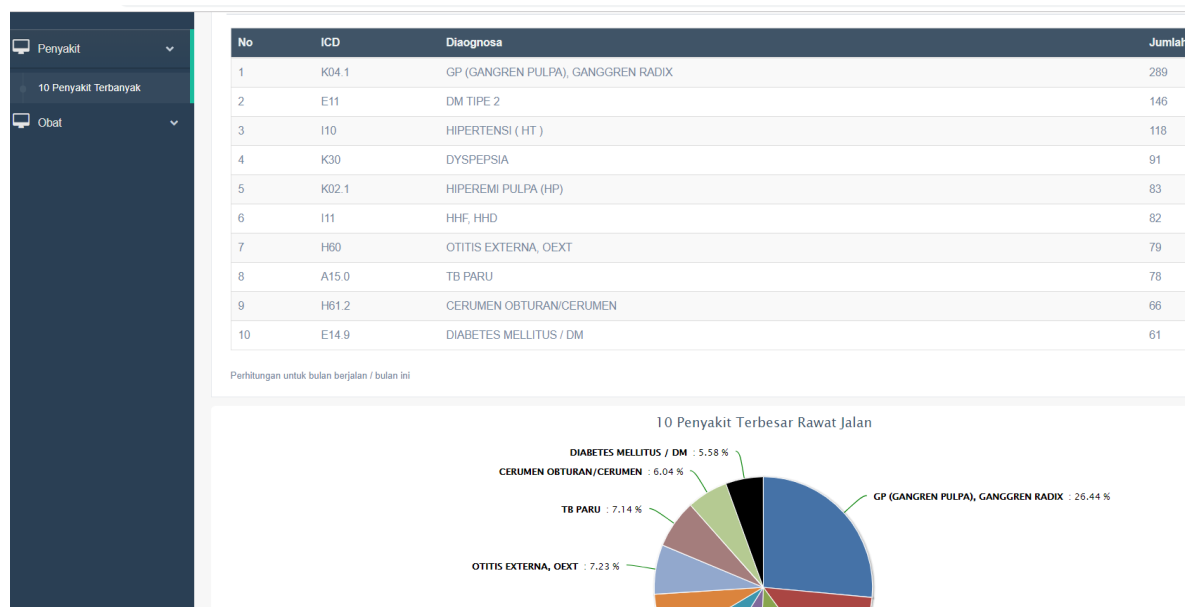


Telemedicine in Makassar.  
Photo credit: Azikin 2016

### SIMRS (Hospital Management Information System)

Launched on March 2017, the Hospital Management Information System (SIMRS) is a web-based platform used by Makassar City Hospital (Daya Hospital) to provide online registration, and information on services and rooms available. Through this service, the public can monitor in real time the number of patients per day, hospital activities, drug dispensation, and disease data. SIMRS is also integrated into the war room dashboard. Figure 20 shows an example display of the top ten diseases in one month.

Figure 20. SIMRS Monthly Disease Data



Source: Makassar Regional Public Hospital 2018

## Other relevant sector data systems

### Governance

Kominfo has created the Open Data Platform for Makassar (see Figures 21 and 22), a web-based database system that provides key information on Makassar government performance and services. The platform generally aims to:

- Support open and smart government.
- Provide an online database for government and citizens to improve data utilization for the community.
- Provide real-time data on an integrated platform with a guarantee of authenticity, recognition, and quality.
- Increase public and government confidence in sharing data in order to increase the benefits and value of that data.

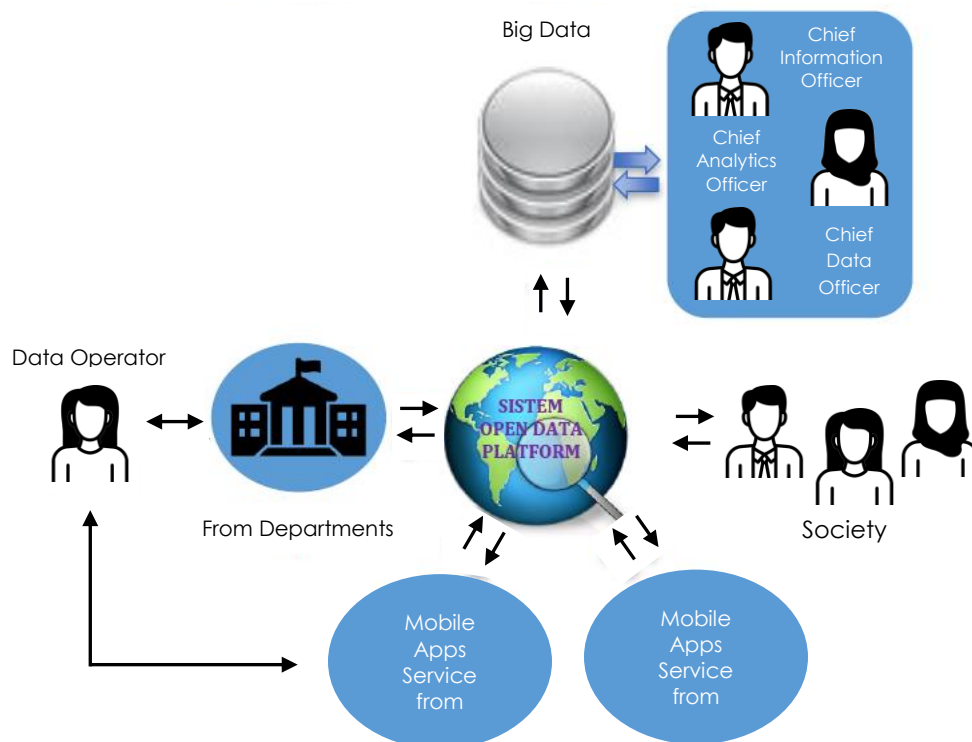
While this system had been in operation for more than one year at the time this report was written, the availability of information was very limited. According to Kominfo, it had not been clearly defined, for example, which department should be responsible for data entry in each office.

Figure 21. Makassar Open Data Platform



Source: Kominfo 2017c

Figure 22. Open Data Platform Flow Chart



Source: Kominfo 2017c



## Civil Services

Launched in 2018, the Kucata'ki (Population and Civil Registry Service) app is an Android-based software for reporting population data. The app allows the public to arrange birth certificates, death certificates, and access other population services online for free, removing the need to visit the registration office in person (see Figure 23). More than 1,000 people have installed this application (Civil and Registration Office 2018).

*“We... have collaborated with the mother and child hospital, puskesmas and kelurahan to help the communities” – Civil and Registration Office (Disdukcapil), August 2018*

In an interview with Disdukcapil (Civil and Registration Office), it was stated that they have collaborated with health centers and hospitals for birth records, and with kelurahan (village office) for death certificates. The app is managed by Disdukcapil, the Health Office, and kelurahans.

Figure 23. Kucat'aki Display

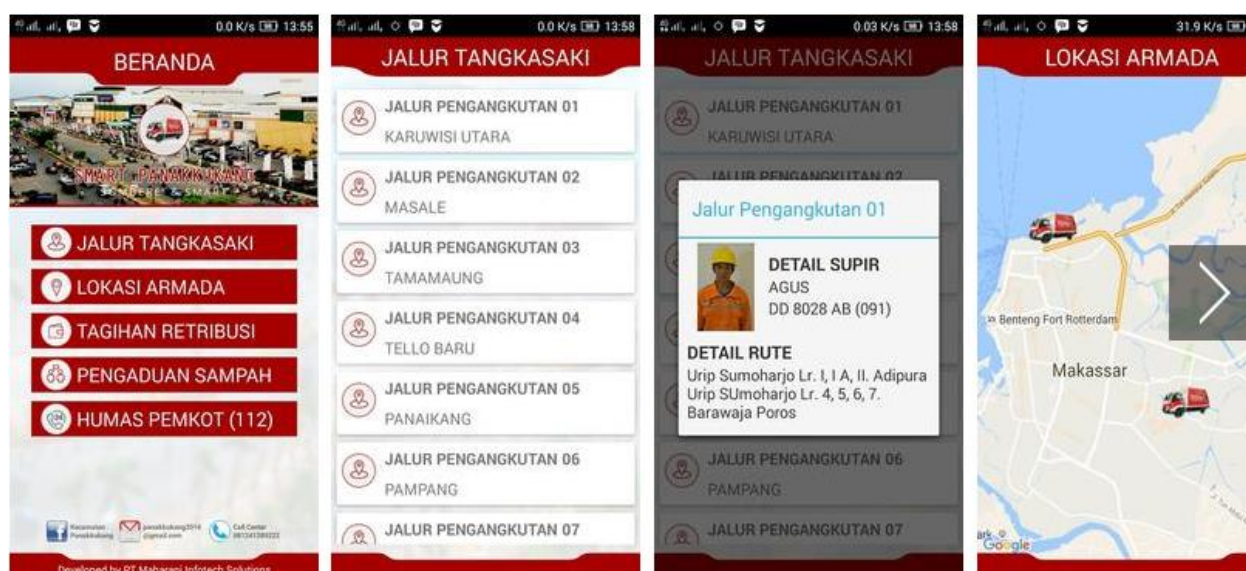


Source: Civil and Registration Office 2018

## Waste Management

Smart Panakkukang is a subdistrict initiative in Makassar connecting people in the Panakkukang area to public services, especially waste management. Features displayed in this app include tracking garbage trucks, monitoring the monthly fee for garbage collection, and managing online complaints related to waste management (see Figure 24). Unfortunately, although launched in November 2016, it had only been installed by 50 users at the time of this assessment. The low uptake could be due to low awareness of the app by citizens.

Figure 24. Smart Panakukang Display



Source: Maharani Infotech 2016

## Transportation

Pasikola, which means student, is a transport service for students at elementary and junior high schools in Makassar. Managed by the Transportation Department, this program is jointly implemented by the nongovernmental organization BaKTI and the United Nations Development Programme (UNDP). Some services available in each car include a mini library, drinking water, a first aid box, fire extinguisher tubes, a radio, electric plugs, air freshener, and a trash can. In addition, the car is also linked into an app called e-Pasikola (see Figure 25). The app facilitates coordination among parents, drivers, and schools.

Figure 25. E-Pasikola Display



Source: Pasikola 2018

The program was launched in May 2017, and by March 2018, had 10 cars serving 103 students in seven schools. Because of support from BaKTI and UNDP, this program was free to the students. However, that support has since ended, and the government of Makassar is looking for other donors to keep this program operational.

## II. Use of Data and Information Systems for City Planning

Governments are increasingly using data in all aspects of their work (Matheus, Janssen, and Maheshwari 2018). Effective data storage, management, and analysis is essential for governments, as they collect a great deal of information across a range of sectors. Without the ability to integrate and analyze those data, and compare them with other sources such as social media and the private sector, important connections and findings across sectors may be missed (Janssen, Matheus, and Zuidervijk 2015).

ICT-based governance strategies have been applied in health and other sectors in Makassar. ICT solutions support each government office to report and share data across sectors. Those data are needed by each government office to carry out evidence-based program planning and policy development.

Bappeda coordinates planning and budgeting across all department programs. Bappeda uses citizen feedback through the musrenbang, or bottom-up planning process (in this context from village to city levels), and existing data from each sector to make decisions around prioritized programs each year. For example, the Healthy Indonesia Card (KIS) program targets low-income individuals, and uses data from the Social Department to determine how many KIS beneficiaries are expected for each

coming year. Bappeda then verifies that estimated number using data from the SIKAMASE'TA, ensuring that budgeting and programmatic planning is on target.

The Health Office is responsible for health development planning, and submits its conclusions to Bappeda. The Health Office uses data from a variety of sources including citizen feedback, health care facilities, and DHIS-2 data on areas such as malaria, TB, HIV, immunization, and nutrition. The Health Office also coordinates with other departments, such as transportation, to implement the multisectoral Healthy City Program, which aims to achieve goals in nine areas: healthy tourism, housing and infrastructure, nutrition, industry, traffic and transportation, forest (green areas), healthy citizens, social aspects, and mining.

Traffic data are also used in city management. Under the Transportation Department, traffic data are obtained and monitored through CCTV and organized manually. Reports is collected monthly, while additional reporting is submitted every three months through the following systems: SIMONEV for monitoring and evaluation, SIADINDA for finance, and SIMLAKIP for department and program performance reports. Bappeda, the city office, and the central government all receive these reports in both paper-based and electronic formats.

As the lead offices on Smart City, Bappeda and Kominfo have tried to integrate data from all sectors into the war room dashboard. Some department data have been shared with the war room dashboard, including civil registration office population data; health office DHIS-2 data; data from city hospitals on real-time drug distribution, the number of hospital beds available, and the number of queues at clinics; data from the Regional Office of Manpower; trade data; and data from the environmental office. In the future, all sectors will be encouraged to share their data with the war room dashboard. With a web-based system, the war room will easily draw out the data needed.

Kominfo launched an "open data" platform to integrate data from all departments. Kominfo will require each department to appoint one data operator responsible to sort all the data. The data operator will be required to prepare, collect, select, and upload the data every month. Unfortunately, this platform still is facing obstacles due to salary constraints for this new responsibility. In addition, appointed operators trained by Kominfo have sometimes moved on to new positions.

In conclusion, the war room dashboard has not yet integrated all existing data. Ideally, the dashboard will be used by governmental decision-makers, but also by the public to scrutinize government actions, to engage in the decision-making process, and to improve decision-making for Smart City activities.

### III. Citizen Access to Data and ICT

Access to data and ICT was varied across geographic and socioeconomic backgrounds.



## Slum areas and low-income communities

Access to ICT was limited among residents living in slum areas and from low-income communities. Mobile phones typically were used for personal communication, and rarely were used to find information and public services. Face-to-face meetings were preferable. Informal leaders, such as the heads of RTs/RWs, were the main source of information about public services. Similarly, RT/RW leaders were the primary channel through which communities reported issues such as garbage, blocked drainage, or security concerns. People in these communities felt more comfortable speaking directly to RT/RW leaders, as they could directly and easily obtain information.

Spending money to buy a mobile data package was considered to be a significant financial burden for people from low-income backgrounds. They believed that the main purpose of having a mobile phone was to be able to communicate with other people directly, rather than access information on available services. Several heads of households did not have mobile phones, and instead borrowed mobile phones from other family members. Young family members typically had smartphones with internet data. They used various social media platforms such as WhatsApp, Facebook, or news sites.

Information about health and other public services most often was obtained through health post (posyandu) health workers, RT/RW leaders, or mosques. People also obtained health information from health workers when visiting the puskesmas, including information on posyandu schedules, and measles and rubella immunization schedules, among others. For those with televisions, three local channels provided information about Makassar, namely Fajar TV, Celebes TV, and TVRI South Sulawesi.

The Call Center 112 phone number had not been well socialized among people living in the slum area and from low-income backgrounds. While this phone number is intended to serve as a resource for those who need information about public services, many people believed this phone number was only for emergency situations.

## Heads of RTs/RWs

The Makassar government had distributed about 6,000 mobile phones to the heads of RT/RWs for the Smart RT/RW program, together with a monthly data package equivalent to Rp 50,000 (US\$4) to be used for the benefit of citizens. The heads of RTs/RWs also formed a citywide WhatsApp group, which was used by the city government and the RT/RW chairperson to share information about problems that occurred in the community and any other information that heads of RTs/RWs may need. This channel was the most popular electronic channel among heads of RTs/RWs. This method, however, lacks transparency and accountability. People could report their issues, but it was difficult to track what issues were most common, and which issues had been addressed.

## Middle-income areas

Mobile phones were commonly used for communication and to access public services in middle-income areas. This particular group was familiar with internet-based platforms.

The amount of money spent for internet access was around Rp. 25,000 - Rp. 100,000 (US\$2-10) per person per month. They used Google, YouTube, or social media sites such as Facebook, WhatsApp, and Instagram, and online news sites for communication and access to information about public services.

This group stated that it was able to access the information that they needed, especially about health and other public services. In addition, free Wi-Fi was available in their offices which offered good internet access. Information about health and public services was also obtained from television, health worker cadres, community meetings, and faith-based groups.

Despite their level of comfort with mobile phones, middle-income respondents still preferred face-to-face communication, as they saw it as a way to strengthen relationships.

## Underserved areas

There are 12 islands in Makassar, 10 of which are inhabited. In remote areas, such as Langkai Island, which is two hours by boat from Makassar, basic infrastructure including information technology, phone signal, electricity, health care, and water installation were not sufficiently available. Additional effort, such as placing a signal booster on a phone, was required to access information from television, radio or mobile phones. Information from TV and radio was available only during certain hours, 18:00-22:00, due to time limits for electricity.

One example of how this lack of access to reliable ICT affected health care was in the case of emergency situations. The focus group discussion in one remote area mentioned that due to the limited signal, health workers were delayed in providing transportation by boat for a patient in labor that needed emergency treatment at a higher-level health facility. This led to the patient giving birth in the boat.

Another effect was limited health education. Due to time limits placed on electricity, people had fewer sources for health education from the internet, TV and radio. This in turn placed limits on the resources available for community health officers providing campaigns for the communities.



Signal boosters in Langkai Island.  
Photo credit: Afdhal Muh

## IV. Barriers to Increasing Data Use

### Cross-sectoral coordination and management

Each department used data from other sectors for planning purposes, requiring data-sharing across departments. The barriers listed below affect this needed cross-sectoral coordination and data management.

#### *Framework for data-sharing*

There was no universal policy in place that required every department to share its data with the war room dashboard. Each department developed its own data-sharing policies, and therefore very different processes for accessing data. The Population and Civil Registry Agency, for example, required an agreement or memorandum of understanding to be in place before sharing data. Only aggregate data could be shared, such as population totals. In addition, while this agency contributed data to the war room dashboard, it in turn did not have access to all data available in that dashboard.

*“No regulations for every departments to share data into war room, just based on commitment...regarding data integration, we have our own platform that encourages all departments to upload data called Open Data Platform.” – War Room Officer, August 2018*

Makassar did not have a guide for electronic sharing of health sector data. Through the cross-sectoral open data platform, published data can be downloaded, while unpublished and confidential data must be requested by letter and delivered by hand. Each department has information management officials who manage data and information requests, including those from the general public.

Government data-sharing protocols were unclear to key staff. In many city institutions, all publicly shared data must be approved by the supervisor of the department. Staff often do not have the authority (or even have direct access to the person who has the authority) to make data public. While the existing open data platform was designed to share data across government departments, there was limited data available at the time of this assessment. In addition, it was unclear what information each government institution was responsible for contributing to the open data platform. Each institution could decide what data to submit, but there was no guidance on how often to report, or who was authorized to submit and approve data, causing concern among staff about the appropriate procedures for reporting.

Data sharing with external programs and NGOs was also limited. These programs and organizations must request access to data, but their requests were often denied. This created a substantial barrier to effective evidence-based decision-making and program planning. For example, health sector programs often require population data for low-income communities. However, this data was often difficult to obtain. Similarly, Makassar planning and development agencies held regular meetings to share data

across sectors, but each agency may not have the opportunity to actually engage with these data and put them to use in their own programming.

### *Human resources*

Departments most often used Excel to collect and process data. Most departments lacked data analysts with the skillset needed to conduct detailed data analysis, resulting in only cursory analysis and data visualization. The war room dashboard staff, for example, had been trained on proper data use but Kominfo did not yet have data analysts. Operators were trained periodically to improve quality of data management and familiarize them with the latest technology; however, there was no training for data analysis. Because there were no data analysts yet, the use and presentation of data was still basic.

In addition, as part of Makassar's commitment to increasing data accessibility, each department was instructed to designate and train data operators. However, this responsibility was often added to the already full workload of existing staff, instead of hiring new staff. As a result, these data operators had limited time and motivation to take on the necessary work to manage and share the relevant data. This led to high staff turn-over, and an increased need for training.

*"... Budget for Area Traffic Control System must be continuous while the procurement might be in first year...and it must have a maintenance system to pay for operational costs. Unfortunately, no budget for this item this year." – Department of Transportation, August 2018*

### *Budget availability*

Not all departments budgeted sufficient funds for data management purposes. For example, the war room dashboard initially integrated transportation data from the Area Traffic Control System. However, due to insufficient budget for procurement and data management, those data are no longer available. In addition, a lack of supported infrastructure and facilities was an issue where ICT was available, but poor limited internet access made sharing data across sectors difficult.

## Equitable access to ICT

### *Phone and internet signals*

Low- and middle-income communities in the city had good access to phone and internet signals across the city. Internet providers developed their technology by maintaining network quality and expanding area coverage. Even suburban communities had strong signal and networks available for accessing

*"... big data usage, it was planned last year, but failed. Because lack of budget... we only budgeted 10 percent." – War Room, August 2018*



information on public services.

This differed from communities living in underserved areas such as Langkai Island. Signals were available in certain spots and sometimes required additional effort such as climbing trees. If people from this island needed to access public services in the subdistrict office located on another island, they spent money on renting a boat, which cost on average Rp 300,000 (US\$20).

### *Smartphones*

Cellphones or smartphones were not seen as a necessity for low-income communities living in slum and low-income areas. Usually, only children and young adults had smartphones. Those without cellphones preferred to communicate with others face-to-face or to borrow cellphones from their children if needed. Some families saved money by purchasing only one smartphone to be shared.

This contrasted sharply with middle-income communities, where smartphones were seen as necessary to daily life. Some people purchased two smartphone or SIM cards, one for calls and one to access the internet. Middle-income communities found it much easier to access the internet, and therefore information available about public services, than low-income communities. Middle-income communities were able to access internet features such as Google, social media, and online news almost every day. Unfortunately, information around Call Center 112 has not been socialized well in this community and middle-income communities rarely used it.

### *Electricity*

Electricity is not a concern for low- and middle-income communities in Makassar. It is, however, a problem for communities in underserved areas such as Langkai Island and Lanjukang Island, where the main source of electricity is gasoline or diesel fuel and solar panels, which are not operational 24 hours per day. This made for infrequent use of electronic equipment, such as television, further limiting access to information.

## 4. KNOWLEDGE GAPS

Based on the assessment findings, the following were identified as knowledge gaps for further investigation and planning:

### I. Data Systems and Integration with Private Sectors

This assessment focused on public systems. However, data systems within private facilities also exist. More information is needed about how private health facility and provider data are collected, stored, and reported in Makassar. Since health insurance also covers private health services, most urban citizens, specifically middle- and high-income, use private sector services. It is therefore important to understand data flows in this sector and how they can be integrated with the public health information system. Even though the private health sector is obligated to share its data, this is not a common practice. It is unclear what penalties the government may have in place to encourage this data-sharing. It may also be helpful to learn about any successful private health sector ICT systems that could be used in the public sector.

### II. Data Sharing Policy Across Sectors

As the leader of the Smart City program, Kominfo made efforts to access data across sectors. The city annual report specified the type of data that all sectors should share. However, in terms of data interoperability, it was still unclear which type of data should be shared by each sector, and the procedure for such sharing. The procedure for data system integration across sectors, such as PCare app linking with puskesmas data, also was unclear. Some sectors required a memorandum of understanding, while others needed permission from higher levels in the department.

### III. Dashboard Role For City Planning Purposes

As the war room dashboard had not received data from all sectors, questions arose on how useful this dashboard could be in supporting Makassar planning. Further assessment should answer this question around dashboard influence for planning purposes.

## 5. CONCLUSIONS

As Makassar realizes its vision to be a world-class, livable city for all, it is important to ensure that data are used for effective and efficient planning. Findings from this assessment can provide context for what kind of data are available, how those data are currently being used, how city residents currently engage with and provide feedback to city officials, and what barriers prevent improved data usage and sharing.

Findings from this assessment can be used to help Makassar reach its goal. The war room dashboard is an opportunity for Makassar to visualize data from all sectors, but regulation to obligate all sectors to share their data was a challenge. The mayor also encouraged more innovation, including e-governance to improve public service quality. However, in some sectors, workforce capacity for managing technology-based innovation was limited. Resident awareness and capacity in using ICT for better public services was another challenge.

The findings from this assessment will be triangulated with findings from BHC's other studies examining the health needs and political economy of Makassar residents. This information will help the city government assess vulnerabilities, barriers, and opportunities for improvement.

BHC will work with city officials through 2020 to fill knowledge gaps and identify opportunities for engagement. The project will follow developments on some of the key stories uncovered in assessment interviews and focus groups to understand how life is changing in Makassar, for better or worse. These specific journeys will illustrate what problems citizens face, how they are advocating for change, and what barriers and successes the Smart City program encounters as it tries to solve those problems. This information is intended to illustrate to other Smart Cities how they can grow while maintaining strong systems that continuously improve the health of all their citizens.

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# ANNEX A

## Key Informant Interview List

Number	Organization	Sector
1	Population and Civil Registration Department	Population
2	War Room (City Operation Room)	ICT
3	Department of Transportation	Transport (monitoring)
4	Public Works Department	Housing/urban planning
5	Health Department	Environmental health
6	Disaster Management Office	Preparedness and prevention
7	Health Department	Health (nutrition)
8	Health Department	Health (noncommunicable diseases)
9	BaKTI (NGO)	Education
10	Institute of Public Policy Study (LSKP), NGO	Public policy
11	Environmental Department	Garbage/pollution control
12	Central Bureau of Statistics	Urban planning
13	Social Department	Social protection
14	Education Department	Education
15	Communication and Information Department (Kominfo)	ICT
16	National Health Insurance (BPJS Makassar)	Health
17	Women and Children Empowerment Office	Social protection
18	Regional Planning and Development Agency (Bappeda)	Urban planning and budgeting
19	Police Office	Police
20	Rumah Zakat (Charitable Organization)	Health/social protection
21	Dompot Dhuafa (Charitable Organization)	Health care

# ANNEX B

## Typology of Resident Focus Group Discussions

Focus group discussions were conducted with the following four groups:

1. Formal housing stock with secure property rights, slum area, populated and lowland area with high risk of flooding in the rainy season, poor infrastructure. Majority of residents informally employed in service sector and daily labor.
2. Populated, and slum area with low income. Majority of residents informally employed in service sector, daily labor, and fishing.
3. Rapidly growing population, with large number of universities, formally zoned layout with good infrastructure. Majority of residents are middle-income class, good access to city services, well-educated but with high unemployment, especially among youth.
4. Remote area (island) with limited basic service (health, electricity and water), limited access to city service. Majority of residents are fishermen.





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