SECURITY SYSTEM TESTING ON ELECTRONIC INTEGRATED ANTENATAL CARE (e-iANC)
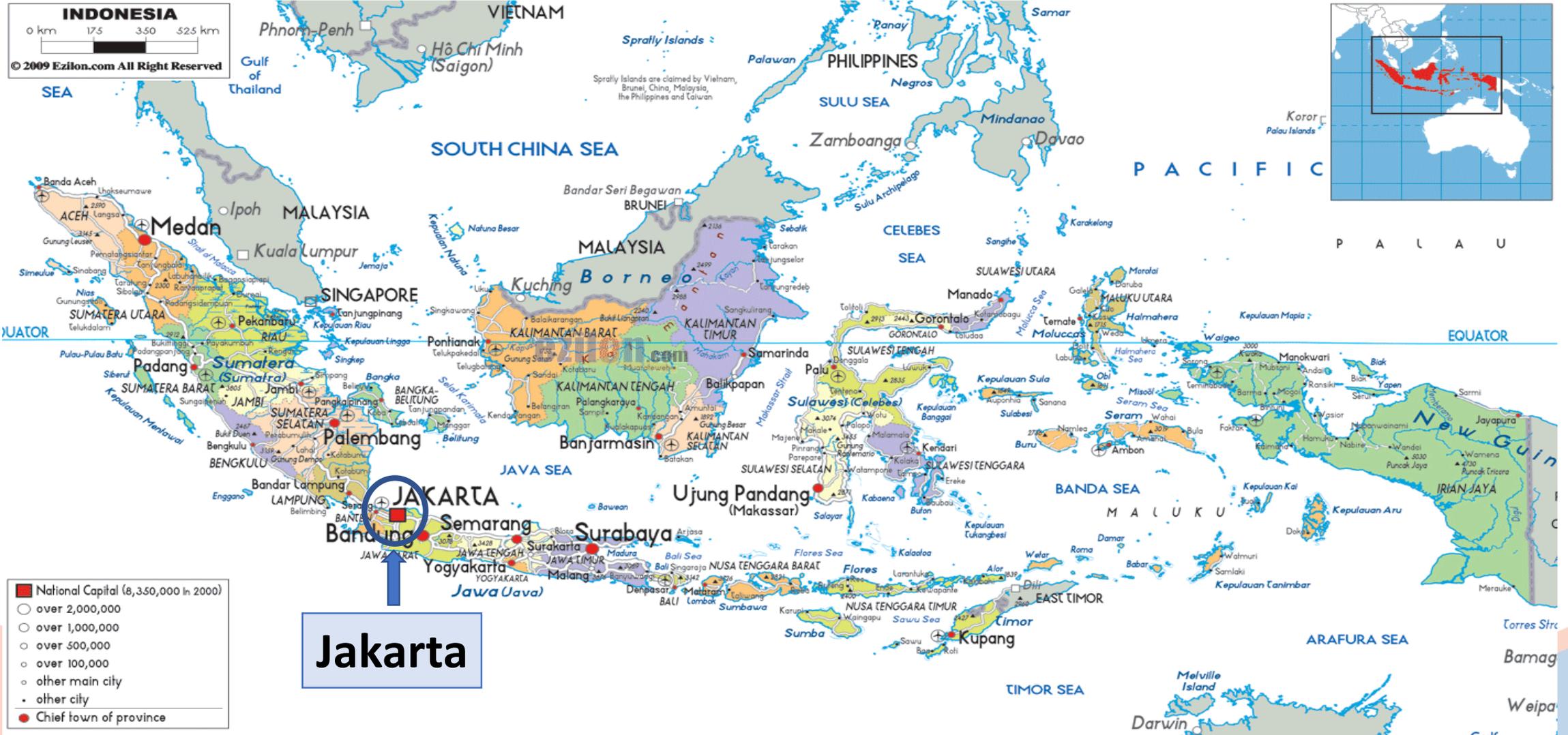
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INDONESIA MAP

Jakarta

OUTLINE

1. **Introduction**
2. **Method**
3. **Result and Discussion**
4. **Conclusion**

INTRODUCTION

Indonesian Maternal Mortality Ratio (MMR)

Trend of Indonesian MMR Year 1994-2012

359 per 100,000 live births

390

334

307

228

359

1994   1997   2002   2007   2012
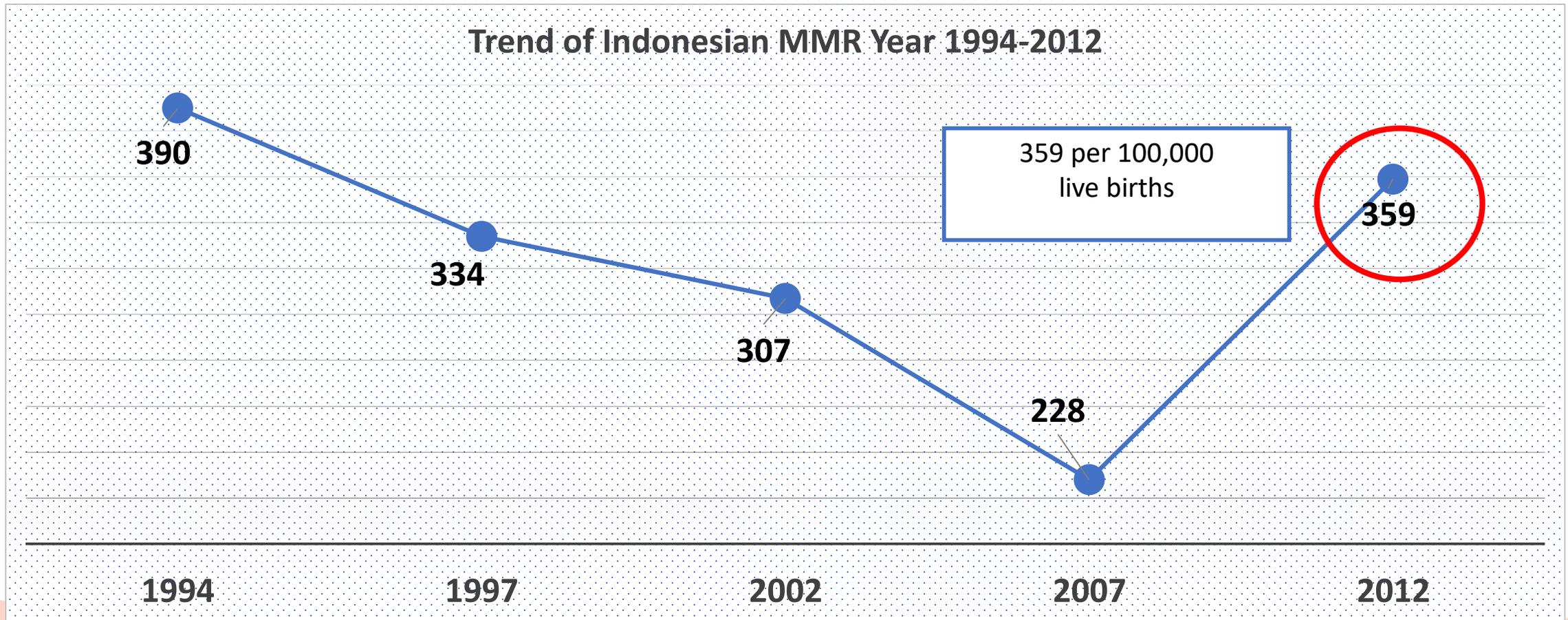
Background

- Indonesian MMR is far above the target Millennium Development Goals (MDGs) of **102 per 100,000** live births in 2015

- This increase happened in spite of improvements in coverage over the same period (2002-2012):
  1. obstetric care or Antenatal Care (ANC) (92%-98%);
  2. delivery by healthcare provider (66%-83%); and
  3. delivery in health care facilities (40%-63%).
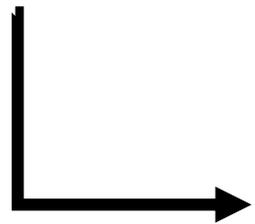
ANTENATAL CARE

Antenatal Care (ANC) services provided by Indonesian midwives include:

- taking vital measurements,

- assessing nutritional status,

- measuring fundal height,

- assessing the presentation of fetus and Fetal Heart Rate (FHR),

- screening for tetanus toxoid immunization status and giving tetanus toxoid if needed,

- dispensing Iron supplements (Fe tablets),

- ordering laboratory tests (routine and special),

- managing cases, and

- counseling.

Midwives must complete several forms to the provision documents of Integrated ANC

1. medical records,

2. detailed pregnancy-related information known as a "Mother Card", the "Mother and Child Health Handbook" (a record provided to the mother),

3. public health reporting forms used for local and national monitoring known as a "Mother Cohort", and District Health Reports.

Data on these paper forms often incomplete and/or inaccurate, thus limiting possibilities for quality improvement analyses

THE PREVIOUS STUDY

- We have been developing Electronic Integrated Antenatal Care (e-iANC) since 2016

Electronic Integrated Antenatal Care

e-iANC is a web-based information system designed to assist midwives in recording integrated ANC data, including patient registration; anamnesis and physical examination; treatment; diagnosis and follow-up advice service.

www.e-ianc.com
www.e-ianc.net

Electronic Integrated Antenatal Care (e-iANC)

Electronic Integrated Antenatal Care

IFHIMA 2019
DUBAI

1. Patient Registration

01

2. Anamnesis

02

3. Physical Examination

03

4. Treatment

04

05

5. Diagnosis

06

6. Follow-up advice service.

A WEB-BASED APPLICATION

- A web-based application (include e-iANC) is a media which is containing much information that can be accessed quickly and freely by the public.

- This condition made it difficult to prevent the introduction of vulnerability, and limited skills and lack of security culture.

- All these factors web applications more vulnerable and exploitable by hackers. In addition, network security and the installation of firewalls lack to provide adequate protection against Web-based attacks

OBJECTIVE

- This study aimed to test the security level of e-iANC web-based application by using the OWASPZAP

- OWASPZAP is Open Web Application Security Project Zed Attack Proxy

METHOD

RESEARCH METHOD

- The website security vulnerability testing was conducted using Open Web Application Security Project Zed Attack Proxy (OWASPZAP) in computer laboratory

- 4 parameters of vulnerability levels including:
  1. Low,
  2. Medium,
  3. High,
  4. Informational.

RESEARCH METHOD

- OWASPZAP as an open source community dedicated to develop and maintain a web-based application and released top 10 risk components include:
  1) Injection,
  2) Broken Authentication and Session Management,
  3) Cross-Site Scripting (XSS),
  4) Insecure Direct Object References,
  5) Security Misconfiguration,
  6) Sensitive Data Exposure,
  7) Missing Level Access Control,
  8) Cross Site Request Forgery (CSRF),
  9) Using Known Vulnerable Components,
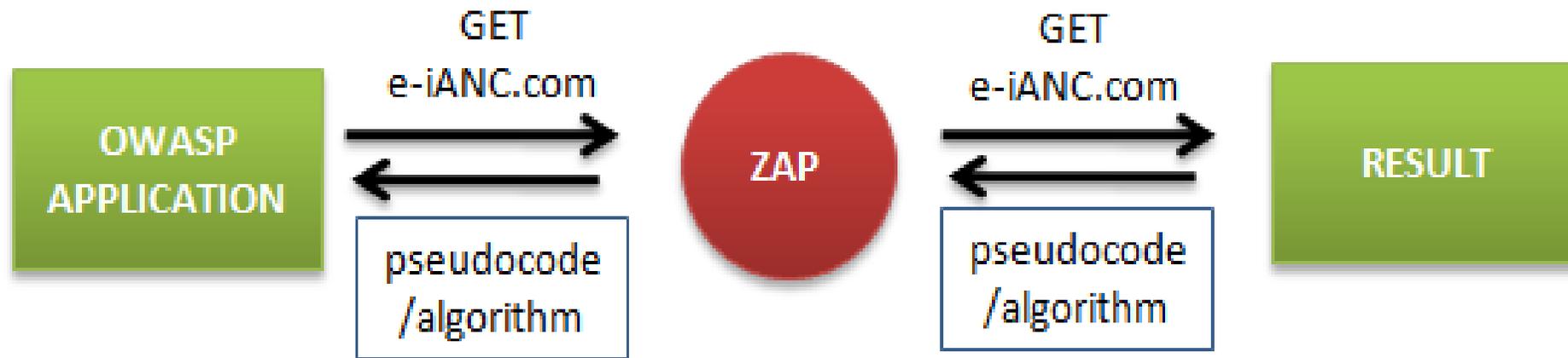 10) Unvalidated Redirects and Forwards.

RESEARCH METHODS

Figure . OWASPZAP test scheme on e-iANC

THE RESULTS OF OWASPZAP APPLICATION

Table 1. Probability Attacks

No	Target (Possibility of an Attack)
1	Cross Domain Javascript Source File Inclusion
2	Private IP Disclosure
3	Web Browser XSS Protection Not Enabled

RISK LEVEL OF e-iANC VULNERABILITY

Risk Level	Number of Alerts
High	0
Medium	0
Low	3
Informational	0

SOLUTIONS TO HANDLE THE VULNERABILITIES OR SECURITY GAPS

No	Security Gaps or Vulnerabilities	Solution
1	Cross Domain Javascript Source File Inclusion	Ensure that javascript files are only loaded on the trusted sources and the sources cannot be controlled by the last users
2	Private IP Disclosure	Erase the personal IP address from body HTTP. To comment use only JSP/ASP/PHP not HTML / Javascript that can be seen by client browser
3	Web Browser XSS Protection Not Enabled	Ensure that XSS filter browser web is activated by controlling header response on HTTP X-XSS-Protection to '1'

CONCLUSION

- Electronic Integrated Antenatal Care (e-iANC) is an innovation which is combining *electronic medical record* and web-based.

- Therefore with only one entry of Antenatal Care (ANC) data, midwives can access real-time individual and aggregate health information of pregnant women.

- The security gaps detected do not endanger the web at http://e-ianc.com.

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