

Information System Design of HIV Infection Treatment at VCT (Voluntary Counselling and Testing) Clinic of Jember Regency

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Abstract. As technology has performed more advanced nowadays, the need for rapid and accurate information is growing for basic decision making for institutions, organizations, and companies. Yet, as a matter of fact, most clinics, health centers, and hospitals in Jember regency are facing similar handicaps especially for registration form of HIV / AIDS patients. This particularly occurs at VCT service as it does not yet have an electronic-based information system. Most services are conducted manually especially for patients to use HIV testing. The aims to create and provide VCT patient information service system at VCT Clinic of Jember Regency. This is a qualitative research using the waterfall method. Waterfall model covers need analysis, system design, coding and testing. Data collection was conducted through interviews and observations. The study resulted in VCT Patient Service Information System. With the development of information systems for VCT patient data, laboratory check-ups, the working performance becomes more effective and efficient so that it can accelerate data distribution and provide accurate information and maintain data security. The information system can be further developed by adding pitc patient data and vct service data specifically for groups of infants or toddlers.

Keywords: *Information System Design, VCT Infection Treatment*

1. INTRODUCTION

The problem of AIDS (Acquired Immuno Deficiency Syndrome) is growing and becomes a global pandemic throughout the world. Almost all countries in the world have increased the number of cases of HIV / AIDS every year. According to the report of the World Health Organization (WHO) and the European Center for Disease Prevention and Control (ECDC) HIV cases have increased over the past one year. Yet, most cases have so far occurred in Eastern Europe and Central Asia. However, the increased number of AIDS cases in Eastern Europe confirms poor diagnosis of HIV, low treatment and delayed treatment of HIV especially for life-saving. Nevertheless, AIDS cases are reported to have decreased steadily in Western Europe by 48 percent during 2006 and 2012 periods. Whereas, in Eastern



Europe, including many countries of former Soviet republics, the number of people newly diagnosed with AIDS has increased by 113 percent.

As a matter of fact, HIV / AIDS has not only become a health problem to date but also has directly become a very serious political and economic problem in developing countries and can even cause poverty. This is an extremely frightening disease becoming one of the major causes of death among men and women and rapidly spreads in developed countries. The HIV virus may be transmitted from one person to another through infected blood, genitals, breast milk and blood, infected male sperm. The virus transmission can occur during blood transfusions, unprotected sexual intercourse or can be transmitted through syringes. During pregnancy and breastfeeding, an infected woman is likely to transmit the virus to her children.

The annual increase of HIV / AIDS cases in Jember Regency requires latest information of the HIV / AIDS epidemic. This information is useful especially to examine HIV epidemic especially to focus on HIV / AIDS activities for effective prevention one of which is to provide the HIV / AIDS information system in Jember Regency. Accurate information on the number of populations prone to HIV and the number of people who have suffered from HIV in Jember plays a pivotal role for policy making and activities to overcome the problems. This particularly will work well with total supports from various parties as problems of HIV epidemic becomes a joint problem.

HIV / AIDS programs, especially VCT services can be conducted based on clients' needs through initial services for both of positive or negative HIV. Such services include primary prevention through counseling and IEC (information, education, communication) such as the understanding of HIV, transmission prevention from mother to child. VCT must be carried out professionally and consistently to obtain effective interventions which enable clients, with the help of trained counselors, to explore and understand themselves about the risk of HIV infection, to obtain information of HIV / AIDS, to identify their own status of HIV infection, to examine responsibilities to reduce risky behaviors and prevent the transmission of infection to others in order to maintain and improve healthy behavior.

The author highlights the problems which occur in clinics, health centers, and hospitals that most of those locations do not implement HIV / AIDS information system, but Dr. Soebandi Jember General Hospital. Through manual system on HIV / AIDS especially VCT patient services, officers will likely find some difficulties when rechecking HIV / AIDS patient forms. In addition, without HIV / AIDS information system, officers find it difficult to recapitulate data on HIV / AIDS with such a large number of patients.

Thus, the author proposes a title: Information System Design of HIV Infection Treatment at VCT (Voluntary Counselling and Testing) Clinic of Jember . Regency in the hope of accelerating service process for HIV / AIDS patients, to reduce workload with better time efficiency so that service quality and data security maintenance are improved. Objective research : To design information system for VCT clinic of Jember regency.

2. RESEARCH METHODOLOGY

This is a qualitative research through developing waterfall method on information system design for VCT clinic of Jember regency. Data collection was conducted through interviews and observation.

3. RESULT AND DISCUSSION

3.1 Need Analysis

Need analysis system is carried out to identify what is needed to optimize performance. In this study, the needs concern VCT patient information service systems. In this stage the researchers conducted interviews with health service officials especially on the needs in the development of the VCT patient care system.

a. Functional Needs

1) Administration

- a) Admin can do login
- b) Admin can supervise all menus in VCT information system for patients' treatment.
- c) Admin can add the data of laboratory check-ups, VCT data, and user data.
- d) Admin can delete VCT data, data of laboratory check-ups, and user data.
- e) Admin can make the data of VCT monthly report

2) User

- a) User can input VCT data
- b) User can input the data of laboratory check-ups
- c) User can input test method data

b. Non-Functional Needs

Whereas, non-functional needs of the VCT patient service information system have things in common between the admin as a manager and information system user such as computer or laptop and other supporters of both media.

3.2 Procedural Design of VCT Patients' Treatment

The design phase is initially conducted through document flowchart creation, followed by context diagram. Context diagram is then divided into several processes at DFD level 1. Database design is made in the form of Entity Relationship Diagram illustrating the relationships among tables. Entity Relationship Diagram illustrates data and the relationship among data working as concept with details of how data is stored in the database.

3.3 Coding

At the coding stage design translating process that has been transmitted into programming language using the Microsoft Visual Foxpro 9.0 as what follows:

- a. Project Manager is used for database interaction
- b. Form Designer is used to design forms
- c. Properties Windows is used to design Application display

3.4 Testing

Testing is a stage to examine software performance especially to ensure whether it is in line with expectations. Testing in this study uses a black box technique focusing on functions of a particular software.

3.5 System Illustration

- a. Form Login Design



Figure 1. Form Login Design

Login form design is an opening form prior to user's program. In this stage, the administrator will provide user with username and password as user data will be input for data validation and to ensure no serious misconduct occur. Login form is obviously user's access rights. Once password and username inputs are correct, then it will directly come into the page of HIV / AIDS Report of Surveillance Information System. Otherwise, notification will immediately appear when incorrect password or username applied.

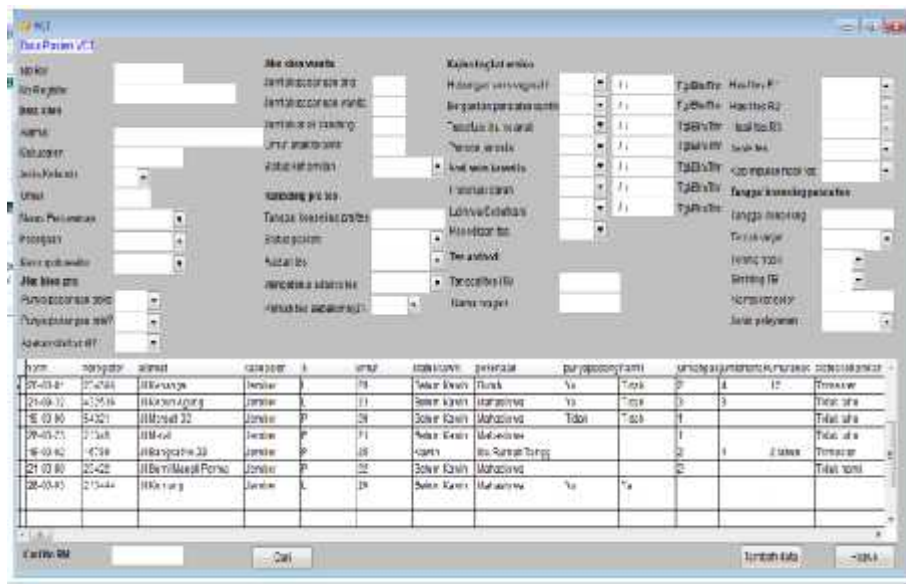
b. Main Menu Design



Figure 2. Main Menu Design

Main menu design is the overall opening page for the VCT patient service information system. Main menu is an important page in a system which functions to manage the system database. Prior to main menu, officers will have to do log in.

c. VCT Form Design

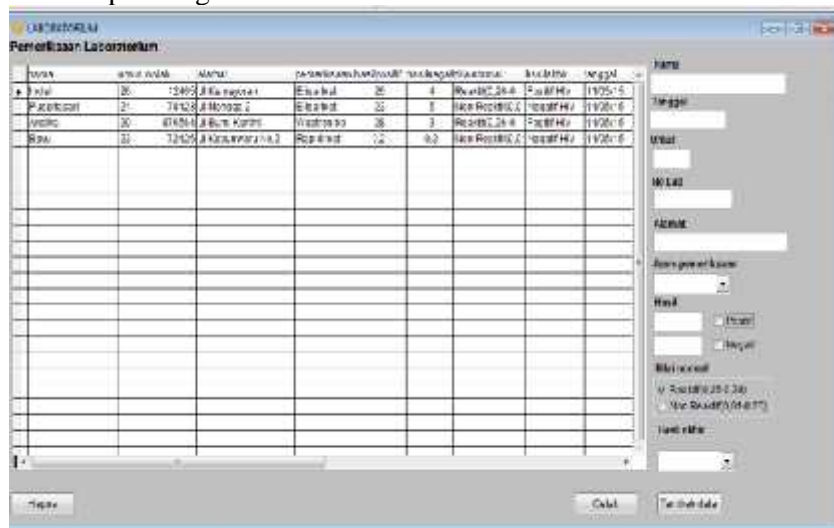


id	nama	alamat	jenis kelamin	usia	tanggal tes	hasil tes	status tes	jenis tes	nama reagen	hasil tes	status tes	jenis tes	nama reagen	hasil tes	status tes
27-03-81	27-03-81	Jl. Kuningan	Perempuan	38	2019-03-17	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
27-03-81	27-03-81	Jl. Kuningan	Perempuan	38	2019-03-17	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
27-03-81	27-03-81	Jl. Kuningan	Perempuan	38	2019-03-17	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
27-03-81	27-03-81	Jl. Kuningan	Perempuan	38	2019-03-17	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
27-03-81	27-03-81	Jl. Kuningan	Perempuan	38	2019-03-17	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Figure 3. VCT Form Design

Such a form of VCT patient service design is used to store HIV / AIDS patient data. This particular form has several options such as the inputs of rm number, register number, address, district, vct date, jk, year, test reason, patient status, reagent name, R1 test results, R2 test results, R3 test results, test availability, level of risk, type of test, date of counseling, accept results, tb screening, name of counselor, type of service, test results. In short, all data is input then save data.

d. Laboratory Check-ups Design

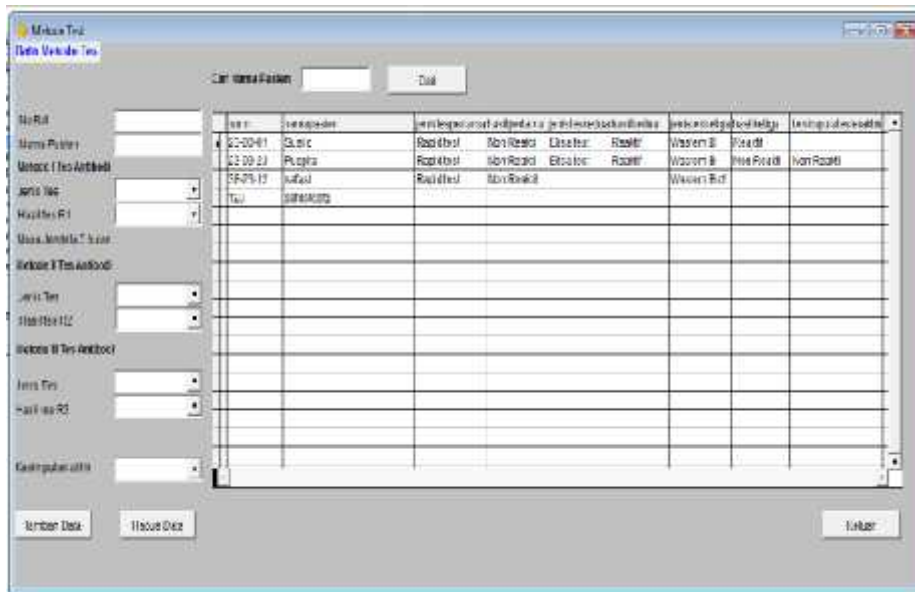


nama	alamat	jenis kelamin	usia	tanggal tes	hasil tes	status tes	jenis tes	nama reagen	hasil tes	status tes
27-03-81	Jl. Kuningan	Perempuan	38	2019-03-17	1.00	1.00	1.00	1.00	1.00	1.00
27-03-81	Jl. Kuningan	Perempuan	38	2019-03-17	1.00	1.00	1.00	1.00	1.00	1.00
27-03-81	Jl. Kuningan	Perempuan	38	2019-03-17	1.00	1.00	1.00	1.00	1.00	1.00
27-03-81	Jl. Kuningan	Perempuan	38	2019-03-17	1.00	1.00	1.00	1.00	1.00	1.00
27-03-81	Jl. Kuningan	Perempuan	38	2019-03-17	1.00	1.00	1.00	1.00	1.00	1.00

Figure 4. Laboratory Check-ups Design

This is the design of HIV / AIDS laboratory check-ups used to store VCT service report data. The design of patient service forms for VCT has several columns such as name, date, age, lab number, address, results, normal values, final results. In short, all data is input then save data.

e. Test Method Design

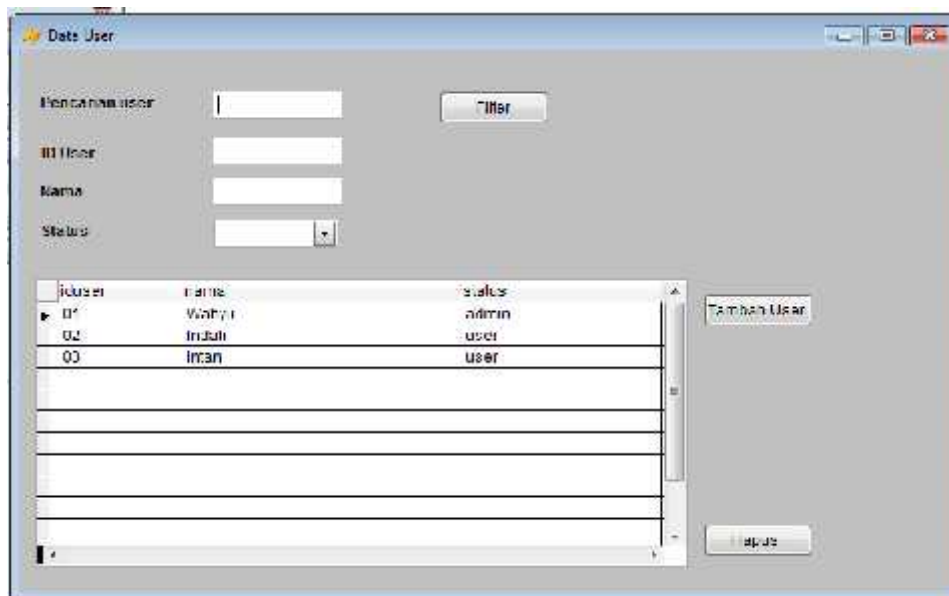


Metode	Reagen	Reagen	Reagen	Reagen	Reagen	Reagen	Reagen	Reagen
00-00-01	Classic	Rapid test	Rapid test	Classic	Rapid	Wasser II	Rapid	
00-00-02	Plasma	Rapid test	Rapid test	Classic	Rapid	Wasser II	Rapid	Non Rapid
00-00-03	Infusi	Rapid test	Rapid test			Wasser II		
00-00-04	Infusi							

Figure 5. Test Method Design

Test method design as illustrated above, officers input first to third of laboratory results by separating first, second and third antibody test methods.

f. User Form Design

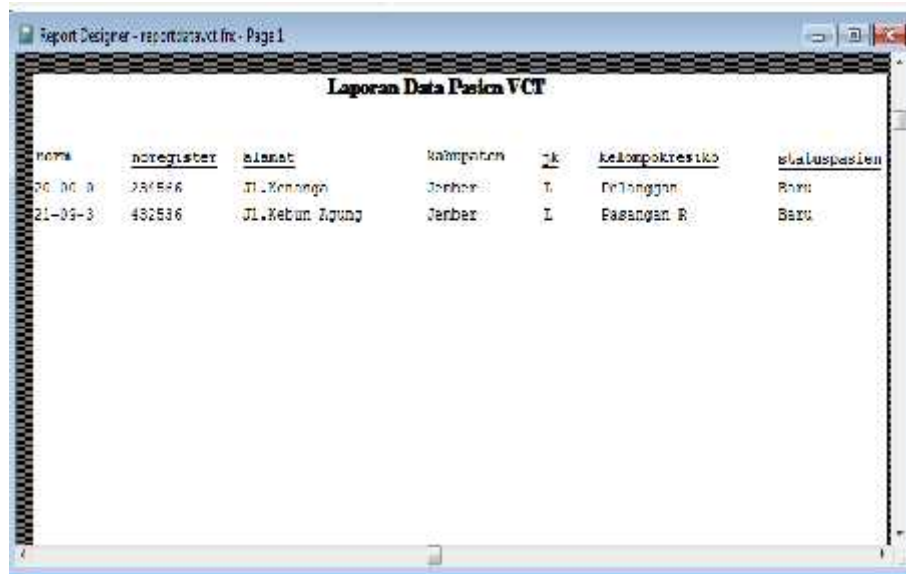


ID	nama	status
01	Wahyuni	admin
02	Indah	user
03	Iman	user

Figure 6. User Form Design

User form as illustrated above is used for user access rights in the VCT patient information service system. This form refers to access rights divided into 2 namely admin and user. Admin has full access rights in using the HIV / AIDS surveillance report information system. It starts from VCT service data addition, user data, lab examination data, and test methods. Admin is the only officer to add user data. Administrator will add username, password, and job status in the information system.

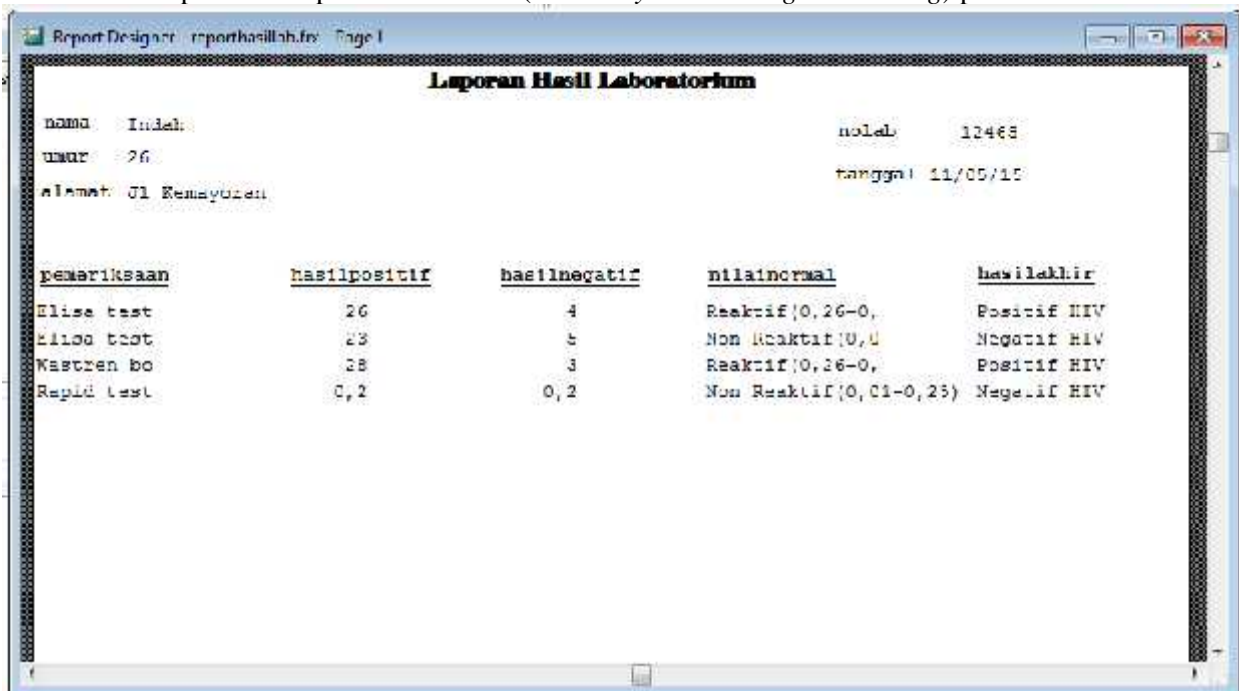
The Design of VCT Patients Data Report



nama	no register	alamat	jenis kelamin	usia	kelompok resiko	status pasien
00-00-0	242556	Jl. Kemuning	Jenber	1	Pertanggung	Ramu
21-09-3	432536	Jl. Kebun Agung	Jenber	1	Basangan R	Baru

Figure 7. The Design of VCT Patients Data Report

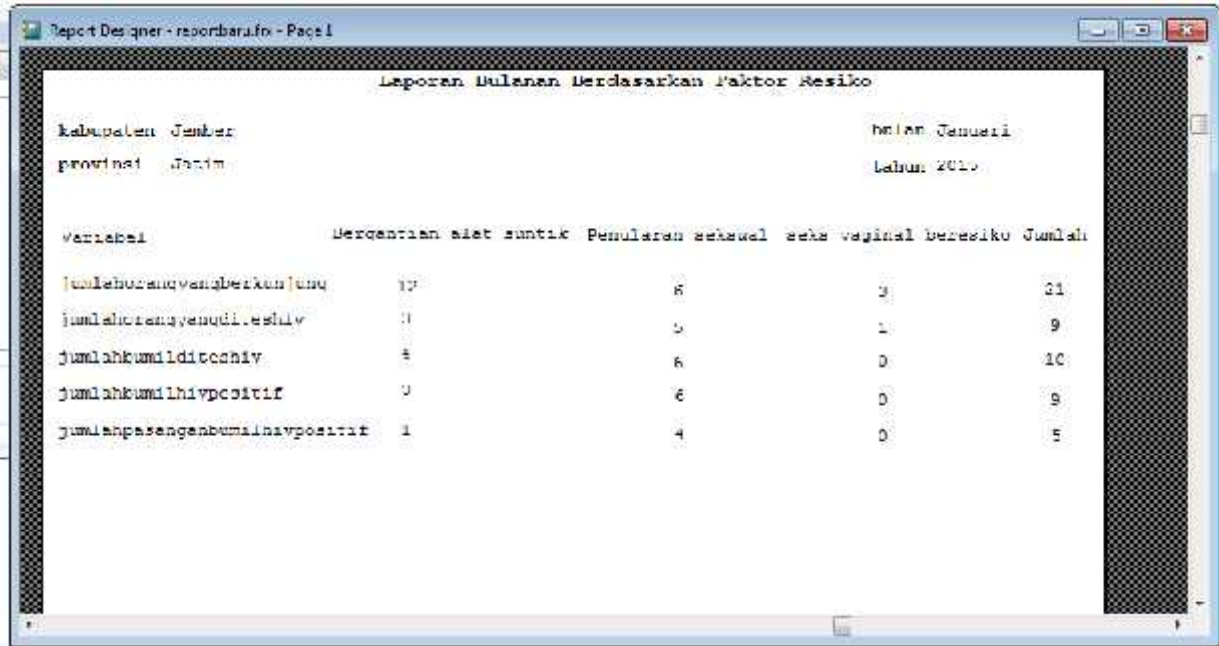
This report shows print out of VCT (*Voluntary Counselling and Testing*) patients service data.



nama	Indah	no lab	12465	
umur	26	tanggal	11/05/15	
alamat	Jl Kemayoran			
pemeriksaan	hasil positif	hasil negatif	nilai normal	hasil akhir
Elisa test	26	4	Reaktif {0,26-0,4}	Positif HIV
Elisa test	23	5	Non Reaktif {0,4}	Negatif HIV
Western bo	28	3	Reaktif {0,26-0,4}	Positif HIV
Rapid test	0,2	0,2	Non Reaktif {0,01-0,25}	Negatif HIV

Figure 8. This report shows print out of VCT (*Voluntary Counselling and Testing*) patients service data

This report shows print out of patients' laboratory check-ups.



Laporan Bulanan Berdasarkan Faktor Risiko

Kabupaten Jenber
 provinsi Jenim
 bulan Januari
 tahun 2019

variabel	Merentian alat suntik	Penularan seksual	seks vaginal beresiko	Jumlah
jumlahorangyangberkenjuna	17	6	3	21
jumlahorangyangdireshiv	0	0	1	9
jumlahkumiditekniv	4	6	0	10
jumlahkumilhiypositif	0	6	0	9
jumlahpasanganbumilhiypositif	1	4	0	5

Figure 9. This report shows print out of patients' laboratory check-ups

This report shows print out of monthly report based on risk factors.

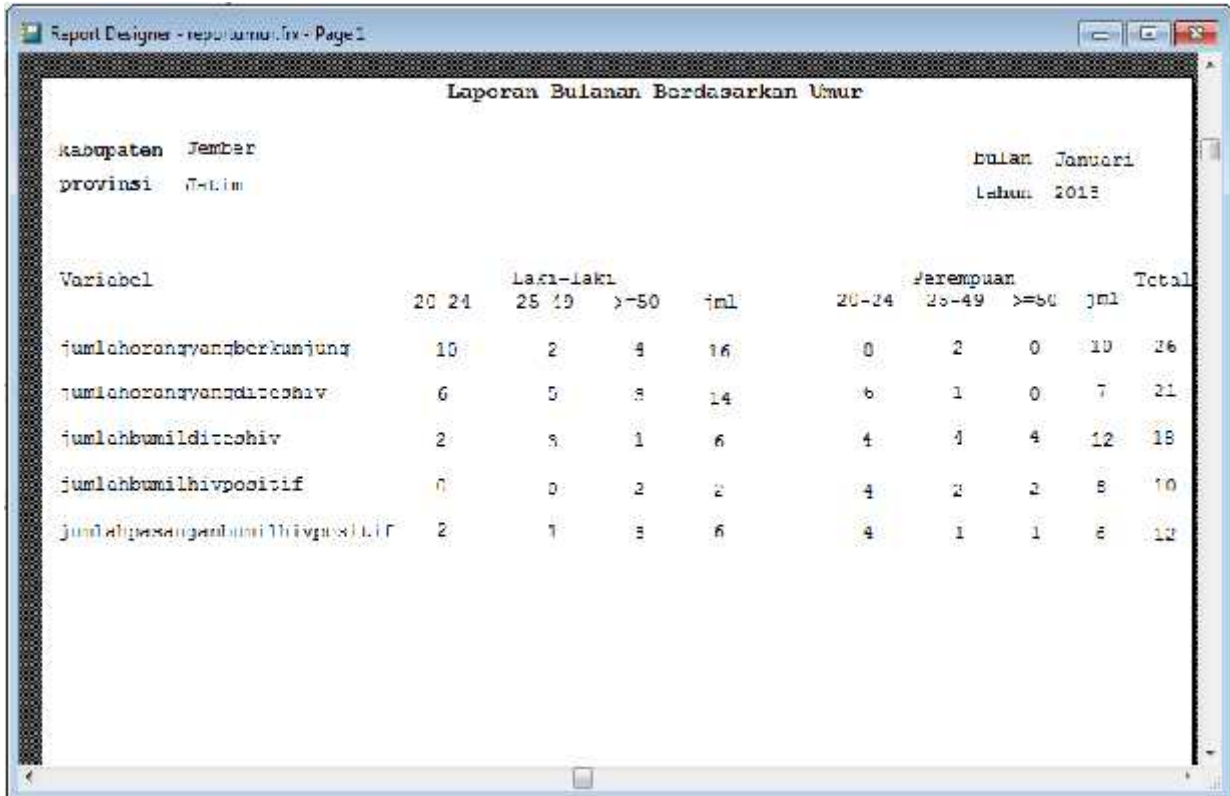


Keterangan Hasil

nama	norm	Terceriksoan			Kelempok Risiko		
		hasillabpertama	hasillabkedua	hasillabketiga	ya	tidak	kesimpulanhasil
Anton	21-00-00	Non Reaktif	-	-	Masa	-	Tes Ulang II
		Reaktif	Reaktif	-	-	Bukan Masa	Tes III
		Reaktif	Reaktif	Reaktif	-	Bukan Masa	Positif HIV
		Reaktif	Non Reaktif	Non Reaktif	-	Bukan Masa	Tes Ulang
		Reaktif	Reaktif	Reaktif	-	Bukan Masa	Tes Ulang

Figure 10. This report shows print out of patients' laboratory check-ups

This report shows print out to identify no no rm and remarks of laboratory check-ups.



Laporan Bulanan Berdasarkan Umur

kabupaten Jember
 provinsi Jember
 Bulan Januari
 Tahun 2013

Variabel	Laki-laki				Perempuan			Total	
	20-24	25-29	>=30	Jml	20-24	25-29	>=30		Jml
jumlahorangyangberkonsung	10	2	4	16	0	2	0	10	26
jumlahorangyangditesthiv	6	5	3	14	6	1	0	7	21
jumlahbunilditcehiv	2	3	1	6	4	1	4	12	18
jumlahbunilhivpositif	0	0	2	2	4	2	2	8	10
jumlahpemeriksaanbunilhivpositif	2	1	3	6	4	1	1	6	12

Figure 11. This report shows print out to identify no no rm and remarks of laboratory check-ups

This report shows print out of monthly report based on patients' age.

3.6 Discussion

The results of this study differ from that of previous research—held in Cirebon District Health Office—especially on an HIV / AIDS surveillance information system design in which the previous research merely resulted in output in the form of case distribution and monthly reports with the use of power designers and Visual Basic for application programs. After overall test of the surveillance system application, the design of application report form was made at the Health Office. Every input in the database will obviously be stored properly.

When compared to VCT Service Information System Design, previous studies have more detailed input data in the form of VCT service data, PITC services, blood donor and information on case distribution, HIV / AIDS, indicator information, database and monthly report.

4. CONCLUSION AND SUGGESTION

Conclusion

1. Based on the analysis the following information has some points to ponder:
 - a. VCT service system is used manually. Thus, VCT report making is Ineffecient and ineffective.
 - b. Information system design of HIV/AIDS can solve problems in the clinics, health centers.
 - c. The VCT information system for patients service is desperately needed as Jember regency has a large and even growing number of HIV/AIDS cases.
 - d. In terms of the opportunity of system development, the analysis of system development, and the need of information by system users, the system design is worth developing.
2. The designs used for information system of VCT patients' service are *Flowchart*, *Data Flow Diagram (DFD)*, *Entity Relation Diagram (ERD)* and table design.

- 3 The design of information system of VCT patients' service uses visual foxpro 9.0 Microsoft application.

Suggestions

Here are some suggestions for information system of VCT patients' service in Jember regency.

1. This particular information system can be developed through the data of pitc patients input in the system. PIRC patients are actively introduced to test and counselling by officers.
2. The information system can developed by adding VCT service data for groups of babies and toddlers.
3. The information system can developed through data inputs of VCT service and automatically made data of laboratory check-ups.

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