

Transformation of infectious diseases and the Indonesian national military health research collaboration in supporting national health security

Soroy Lardo

Division of Infectious Diseases and Tropical Medicine, Department of Internal Medicine, Indonesia Army Central Hospital Gatot Soebroto, Indonesia

Abstract

Transformation of infectious diseases is a dynamic movement of the spread of disease that is largely determined by the ability to understand geomedical maps, disease transmission and impacts on national security. Disease transformation is an order of infection that can be life threatening in a clinical perspective an outbreak at the community level. The involvement of the Indonesian National Military (*Tentara Nasional Indonesia*, TNI) in the transformation of infected diseases is a network that needs to be strengthened, considering that its role is very important to maintain health security as a gate for national security. Strength in dealing with the extraordinary event of infection requires on going collaboration, competence, networking and integration.

Introduction

The Indonesian National Military (*Tentara Nasional Indonesia*, TNI) Health Research is an organization to reinforce health security. Due to the historical process since independence war, the role and function of TNI is different from that of similar institutions in other countries. The history of Indonesian independence with its guerrilla warfare has provided specified concepts, idea, strategies and managerial values along with TNI health contribution through the role of field health services to enhance military battle operation.¹

Dealing with the changing battle pattern from conventional to modern, infectious disease associated with battle transformation has a role in biological and chemical wars. However, our understanding about infectious disease is not detached from interaction process between body system and military battle environment.²

Unlike developed countries, the concept of field hospitals has precisely expanded

during the stages of national struggle and development. The typical field hospital in Indonesia was initiated by a health platoon forged by migration of guerrilla warfare, which constantly kept moving from one place to another. Geographical and epidemiological differences of diseases in migration area had become an essential lesson in the development of organization structure and human resources including TNI soldiers that subsequently proceeded to a health battalion along with a field hospital.³

The establishment of strong TNI health organization with missions on health care services, health care support and research in health development indicates the importance of management of resources and territorial power. Territorial empowerment with functionalization of territorial non-commissioned officers becomes a main benchmark of synergy of TNI health in the community.⁴

Materials and Methods

The method developed in this paper is the study of infectious disease transformation strategies to support health security policies through continuous collaboration, integration and networking (Figure 1).

Transformation of Infectious Diseases and Zero-War (Nir-Yudha) Policy

The context of infectious diseases nowadays is associated with various system interactions, which are internal and external systems. The internal system is body system with a capacity of cell degeneration that has impacts on changes and structures of immunity system when dealing with a microorganism intervention. Degenerative diseases that become comorbidities now such as diabetes, hypertension and geriatric conditions have brought a new power for infectious diseases to set in a condition of aggravated infectious cases in a community; while the external system is an environmental or even global condition that affect the behavior of infectious diseases to have an asymmetric relation with its generated reality. One of those that has been published is a new strain of influenza virus that may have a potency of outbreak similar to the H7N9.⁵

Some factors that affect the development of infectious diseases are: (1) Social events, which are associated with lack of economy, interpopulation conflict and explosive migration; (2) Health problems, particularly the extensive use of antibiotics without considering rationales and side effects; (3) Food production, which is associated with preparation, processing and

Correspondence: Soroy Lardo, Kramat Jaya Baru Street F1/280 Central Jakarta 10560, Indonesia.

E-mail: soroylardo@gmail.com

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packing; (4) Social behavioral changes, use of narcotics and travelling behavior; (5) Environmental changes such as deforestation, ecosystem changes, flood and drought; (6) Infrastructural problems on community health, which are surveillance and limited infection control; (7) Microbial changes.⁵ The abovementioned condition bridges infectious diseases in association to the impact of global warming (GW) over a national problem that needs special attention.⁶ Flood, forest fire and drought increase respiratory disorders as well as early death due to respiratory and cardiovascular disease. Their indirect impacts are changes in the bionomics of the mosquito vector as with increasing temperature and certain humidity, there will be mosquitoes with more active mating and with shorter life cycle, which will cause increased mosquito density; therefore, it may have impacts on greater level of infection in the community.⁶

Results and Discussion

Policy on military battle transformation is one of technology-based modern systems that must be continuously developed. The no war or zero-war policy (*Nir Yudha*), according to Moeldoko,⁷ is an effort and it

becomes the most essential learning source about meaningless role of any form of armed violence. War may provide a piece of confiscated land, an imperial structure that on top of that may develop into a civilization. However, a civilization established using armed violence will soon be gone, leaving war debris and wreckage. Only innovative creation of human thought and mind, which is developed in a free and joyful manner, can be a long-lasting legacy of civilization. War, or military attack to be exact, is an acceptable sacrifice of resources as it can be repaid by confiscated resources that may provide better advantages or even glory. However, it obviously wastes resources and it is a potential resource of a problem.⁷ Dealing with the era of battle transformation nowadays, it is necessary to create a new climate of consideration, which denies war by transmitting an understanding of human basic equality with various differences that are obvious on the surface.⁷ Utilization of regional district encourages creation of self-consciousness that can be placed side by side with each national identity. One of the main roles is the role of TNI health in Military Operation of War (MOW, *Operasi Militer Perang*, OMP) and Military Operation Other Than War (MOOTW, *Operasi Militer Selain Perang*, OMSP).^{2,4}

The role of Indonesia is to be the front-line pioneer in establishing confirmed peace of a dynamic geopolitical region. The ongoing war may be unavoidable, but the upcoming war can be prevented indeed. On the last calculation, the zero-war (*nir-yudha*) policy is a military translation of civil policy to enhance welfare and to wipe out poverty (zero poverty). Military or Armed Forces have the duty to maintain democratic growth and freedom against various parties that endanger democratic climate. Guarding peace and basic human rights of a nation so that a region can grow with full dignity is the scope of work of military folk that is extremely worth to be fight for with all one's might.⁷

Discussion

TNI Collaboration Research and Health Security

One thing that has been slightly forgotten nowadays is the importance of research collaboration to support Health Security. Research should be established not only based on the norm and power of scientific evidences, but also should reach the perspective of national defense. Developing Indonesian National Military research is a form of TNI's concern on education and

research.^{1,4} The developed scope includes research in military technology and disciplines that support the objectives of the Indonesian National Military (TNI) development including military medicine. The ongoing research nowadays through the TNI internal research and development institution has resulted national and international publications. However, the institution should be developed further as an instrument for integrated networking with research collaboration. Collaboration and integration would become inevitability if the Indonesian National Military yearns for further advance in research.⁴

TNI research is a process of research in general, which finds new innovation of military system and doctrine that becomes basic reference of activities as civil servants. The concept of innovation is a

process of thought and scientific-based management of military resources; therefore, it can create futuristic mission on enhancing TNI ability as the users of power and the guardians of national defense.⁴

TNI territorial development during the new order era through the principle of Unity in the Military Armed Forces of Indonesia (ABRI *Manunggal*) has set an important notification for research development in the field. Territorial social service activities, which were initiated as a breakthrough program, have raised isolated regions to be connected with social and economic changes in the community. The concept becomes an essential reference that TNI has established axiological science based on field application. Their involvement in world peace through the Garuda Contingent is an embodiment of development and orga-

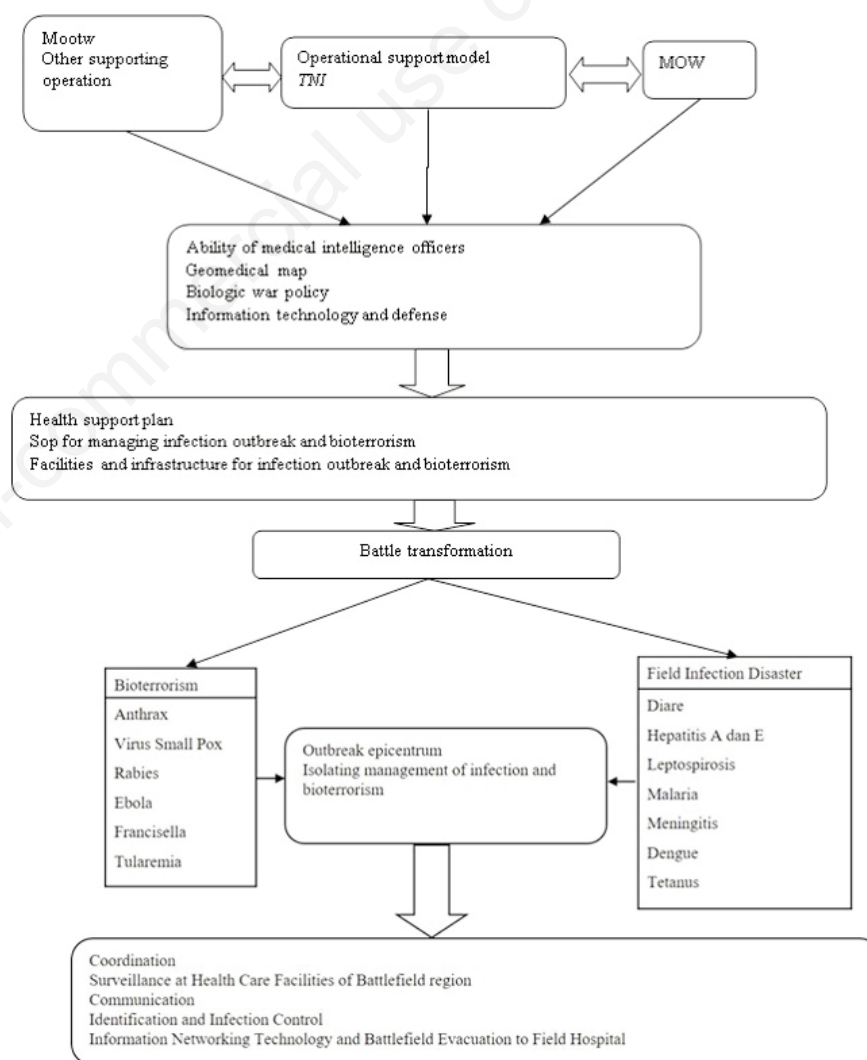


Figure 1. Model for management of infectious disease and bioterrorism in battle transformation.

nizational tasks with multidisciplinary scientific structures of the *TNI*. The success that has been achieved indicates that the *TNI* has a system and structured method for work target that has become its goals.^{4,8}

Through the three above mentioned activities, it has been demonstrated that the research instrument in *TNI* is very extensive, from the upstream to the downstream level. Research of the upstream level includes policy concept of *TNI* activities as an update on the development of military technology as an innovation of improving functional ability on defense force. The downstream research includes empowerment of *TNI* resources and their supporters to optimize the function of military operations of war (MOW) duties and the military operation other than war (MOOTW) such as disaster management. It is expected that the axiology of *TNI* research can be developed based on epistemological approach as the basic principles of further *TNI* activities.^{4,8}

Integration and Networking

Integration and networking of *TNI* research rest on three aspects. The first aspect is developing or completing infrastructures of research institution of the Armed Force of *TNI*, which currently is a strong institution. The Research Institution of the *TNI*, in fact, is easier to combine considering that the institutional infrastructure of each military force has performed research activities. The second aspect is opening networking with military research institution of various countries based on principles of openness and transferring science based on principles of universal scientific collaboration. Through the gate of research collaboration, it will connect diversity and peculiarity of each country to fill the gap of basic military research to support the arrangement and execution of military and non-military operational activities. The third aspect is empowerment of *TNI* human resources that had been prepared early so that it can cope with the interconnection of global collaboration in military research. The fundamental base that has been developed is the fighting character of *TNI* human resources on the early moment of duty in different field scopes (axiology) as well as having a perspective of the process of action without denying the epistemological values of research. For example, an assignment during disaster is a huge integration of organization and multidisciplinary human resource, which so far has structured standard operating procedure (SOP), both in planning and execution. Benchmarking of effective utilization of human resources during disaster should be supported by research.⁴

TNI Research Innovation and Its Prospect

Innovative research is a main key of *TNI* research. The empowered scope is bridging military socio economy process (epidemiology) of tight domestic and foreign assignment with the utilized military technology and the most updated validation. Innovative research, in consistent with its function, has developed a new level of research, which is guided by results and aims of study to support *TNI* duties and basic functions.⁴

Currently, innovative research in *TNI* has been growing rapidly. The level of research development includes material and non-material aspects. On material aspects, which are associated with primary weapon and defense system or the *alutsista* (*alat utama dan sistem persenjataan*), the research and engineering has been very advanced. Non-material research is associated with the empowerment of various supportive scientific disciplines, which has important contribution in applying the main duties of *TNI* such as some applied activities of soldier assignment at the borders. In military medical sector, currently the ongoing research involves a study on malaria herbal drug as a prophylaxis for soldiers who are on duty at the border of malaria endemic region. The study is collaboration between the Institute of Tropical Disease, Airlangga University and Kimia Farma Corp. Results of the preliminary study have demonstrated the efficacy and safety of the first study, which was then continued to the second study to evaluate the efficacy, which is followed using a cohort method.⁹

The principle of innovative research in *TNI* is to empower the ongoing institutional component by optimizing facilities in *TNI* institution into a harmonic work system of research and development system among the military forces. The policy that has been introduced is the spirit and breakthrough of *TNI* research through several steps, which are: (1) Drafting the framework of institution for *TNI* research as well as its future role as national research networking; (2) *TNI* research institution has one command chain with each research institution for every military force; (3) Developing an integrated network system for research institution of military force, particularly in optimizing the collaboration of both domestic and foreign military research; (4) Empowerment of human resource for military research through a breakthrough of carrier path, work stratification, certification for research investigators and academic competency as military research investigator that allowing them to have an appreciation of promotion based on their work per-

formance.⁴ Military research investigator previously was a complementary profession; however, global development has demanded a reorientation of policy as good as a promising alternative carrier and has a similar prospect with the main military work scope; nevertheless, a hard work and strenuous effort are necessary to achieve it.⁴

Conclusions

The *TNI* health research is a main gate to open the role and function of empowering the transformation of infectious disease, which is a threat to health security. Institutional power will support an integration and networking with various domestic and foreign research networking that enhance the spirit and technology innovation based on health security principles.

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