

# AIDS: some challenging ethical questions

## *AIDS: algumas questões éticas desafiantes*

Jacques Simpoire\*

**ABSTRACT:** HIV/AIDS is a public health issue in a worldwide scale because of its high prevalence, its pathogenic character, and its mortality and morbidity. *Acquired Immunodeficiency Syndrome* (AIDS) is a particular disease, which entirely affects infected persons: their physical appearance, their psychological balance, their morale, their close relatives and all their social relations. Because of the moral issue related to the disease, stigmatization and discrimination can arise in society regarding *Human Immunodeficiency Virus* (HIV) positive individuals. In addition, many ethical problems arise, not only as regards the prevention of HIV/AIDS, its screening and medical care, but also in what concerns pharmaco-clinical research for the production and commercialization of antiretroviral drugs.

**KEYWORDS:** HIV. Screening. Ethics. Medical Care.

## INTRODUCTION

According to the 2012 estimates of the United Nations Organization in charge of AIDS (ONUSIDA), 35.3 million people lived with HIV/AIDS; 2.3 million new infections were recorded and 1.6 million deaths were notified<sup>1</sup>. From 1981 to date, AIDS has caused more than 25 million deaths; more than 15 million orphans<sup>2</sup> and has made several million widows who are languishing in misery<sup>3,4</sup>. It is true that plague has terrorized and destroyed many men and women during the past centuries, and the Ebola virus is terrifying and challenging human kind currently. However, in living memory, no pathogenic infectious agent, by its aggressiveness, violence and virulence, has ever provoked in mankind so much physical suffering as well as moral misery and deaths among young people, as HIV.

With the appearance of this new pathology, called “*the disease of the century*” which destroys preferably people in age of childbearing, very often, an unspeakable and unimaginable paradox arises: grandparents rediscover themselves, with bitterness and sorrow, as fathers and mothers of their grandchildren who have become orphans.

HIV is a retrovirus that infects man and leads, in more or less long term, to AIDS. It can also make the

organism more vulnerable for its host, through some co-infections, associating with other pathogenic agents such as the hepatitis B (HBV), the hepatitis C (HCV), *Mycobacterium tuberculosis*, the human Papillomavirus (HPV), the human herpes virus 8 (HHV-8), *Treponema pallidum* etc. Although there are now some anti-retroviral treatment (TARV) against HIV, consequently permitting to delay its appearance and reduce both its mortality and morbidity, there is, to date, no vaccine or medicine capable of eradicating it.

Consequently, without an appropriate prevention, a sound research of medicines and efficient vaccines against HIV, a good professional medical code of ethics and an ethics of responsibility in human behavior, individually and collectively, entire generations of young people, in the prime of life, will surely disappear from many poor areas of the world which are highly HIV endemic.

So, the AIDS bioethical issue is related, on the one hand, to the ethics of sexual behavior hygiene, to health and anthropologic imperatives such as medical secret, confidentiality, free and informed consent, counseling and screening, diagnosis, pharmaceutical and clinical test protocols, prevention, human dignity, stigmatization, solidarity; on the other hand, the issue is related

to patents, to Trips (*Trade-Related aspects of Intellectual Property Rights*) agreements, to financial cost of research and lifelong cares for HIV infected individuals.

## HISTORY OF HIV/AIDS AND ITS BIOMEDICAL ASPECTS

### History

According to the “*Polymerase chain reaction*” (PCR) tests carried out in 1981 on preserved samples, the first infections by HIV dated back to the years 1950, long before the appearance of the infection in the United States<sup>5</sup>. Thus, the history of HIV/AIDS unfolds in the following steps: **1980**: in Los Angeles, 3 homosexual patients presenting clinical signs of weight loss, fever, mycosis, mouth candidacies and pneumonia as well as an abnormal rate of blood cell CD4 lymphocytes, have been detected and treated. **1981**: the bulletin MMWR (*Morbidity and Mortality Weekly Report*) published 5 cases of a rare pathology: lung pneumocystosis<sup>6</sup> which mostly occur in immunodepressed patients; on July 3, 1981, the New York Times published an article reporting 41 other patients presenting a Kaposi’s sarcoma. At the same time, similar cases were detected in Europe. **1982**: CDC named this new pathology AIDS “*Acquired Immune Deficiency Syndrome*”<sup>7</sup>. **January 3, 1983**: the team led by Professor Luc Montagnier in France, discovered the Lymphadenopathy Associated Virus (LAV)<sup>8</sup>. In September of the same year, Luc Montagnier patented a test “ELISA” (*Enzyme-Linked immunosorbent assay*) capable of showing the presence of anti-LAV antibodies. **1984**: Professor Robert Gallo, from the United States of America discovered the Human T-cell lymphotropic virus type III (HTLV-III) and immediately asked an international patent for the “*anti-HTLV3 antibodies test*”. These discoveries and those patents provoked heated debates since Montagnier and Gallo both claimed the paternity of the discovery of this retrovirus. The reconciliation between these two famous researchers occurred only in early 2000. **1985**: 2 important events took place: the commercialization of the first diagnostic tests and the introduction of the first pharmacological trials.

**1986**: the international committee of virus taxonomy adopted the name HIV instead of LAV and HLTV-3. In that same year, Luc Montagnier and his team discovered a second type of virus that they named HIV-2. **1987**: the first molecule against HIV/AIDS was discovered: the Azidothymidine (AZT), an inhibitor of the reverse transcriptase. **From 1990 to 1995**: a move was made from mono-therapy to dual-therapy: zidovudine + saquinavir. **1996**: it was the beginning of the triple-therapy with the new protocol: Highly Active Anti-Retroviral Therapy (HAART). **2008**: the international scientific community clarified the paternity of the discovery of HIV and awarded the Nobel Prize of Medicine to Professors Luc Montagnier and Françoise Barré-Sinoussi. **From 2008 to date**: the history of HIV and AIDS goes on with the discoveries of new subcategories of HIV, new circulating recombinant forms (CRF), new strains resistant to ARVs, new medicines and vaccines under experiments, new challenges to take up such as the “sanctuarization” of provirus integrated in memory cells, virus reservoirs.

### Modes of infection

There are three main ways of transmission of HIV: Transmission through sexual contact; Parenteral infection through infected human biological liquids such as blood, breast milk, male seminal liquid, amniotic liquid, female cervical secretion, etc. Vertical transmission from mother to child through placenta or perinatal<sup>10</sup>.

The infection process is quite complex since it requires several elements in the host (CD4 receptors, CCR5 or CXCR4 co-receptors) and many steps (the recognition and fixation of the virus on the Cluster of differentiation antigen 4 (CD4) receptors and the C-C chemokine receptor type 5 (CCR5) or CXCR4 co-receptors of the lymphocyte T4, the membrane to membrane fusion, the injection of the virus genome in the cytoplasm of the host cell, the inverse transcription of the viral ARN into double strand DNA, the pro-viral DNA integration, the transcription of the ARNm of the integrated provirus, the assembling of the viral protein, the burgeoning of the virus and its diffusion in new cells of the host).

### Diagnosis of the HIV/AIDS infection

There are two types of methods: direct and indirect methods.

The direct methods try to isolate the virus itself from lymphocytes: looking for the p24 antigenaemia, amplification and identification of the viral DNA by PCR. The indirect methods do not target the virus directly, but the detection of anti-HIV antibodies produced by the human organism in contact with the viral antigen. The most common and used methods are the test ELISA and the Western Blot. It must be specified that there are two types of tests to reveal if someone is HIV-positive:

*The screening tests:* these tests are very sensitive. It is very rare to get wrong negative results, but this test lacks specificity. This means that every positive result must be confirmed by a very specific test known as “confirmation test”.

*Confirmation tests:* the confirmation test resorts to a more sophisticated technique in laboratory whose interpretation is validated by the World Health Organization (WHO). Its result can be positive, negative or undetermined. If the test is undetermined, a period of 2 to 4 weeks must be observed before making new sampling for testing purposes. This period is the “window period” since there are not yet enough antibodies to be detected unless the PCR test is used.

### Therapy

In the absence of anti-retroviral treatment, the majority of the HIV infected persons will evolve toward AIDS, the ultimate stage of the disease. Nowadays, many types of antiretroviral drugs are available for the treatment of patients infected by the Human immunodeficiency Virus. These mono-, dual- and triple-therapy even cocktail-therapy have truly made the proof of undeniable therapeutic efficiency. Nevertheless, all the patients cannot benefit from these multi-therapies for many reasons: There are important secondary effects to the treatment for many patients; For some patients, HIV mutant strains also become resistant to these multi-therapies; The treatments are heavy and difficult to stand, and some patients cannot respect them all their

lives; The prices of these ARVs still remain very high for patients of developing countries.

### Research

Nowadays, the gene therapy made its first move not in the clinical services for the treatment of some hereditary genetic pathologies and some cancers. As for AIDS, the HIV which causes it is a virus that has a great variability and a very important genetic diversity that impede the research for efficient vaccines and medicines. However, it is to be noticed that the gene therapy which is being developed will allow in a close future, to act on targeted molecules some of which cannot be reached, to date, by classical medicines. In this perspective, some target cells that could be “transduced” ex vivo with genes of interest are probably: lymphocyte T CD4+, macrophagic monocytes and dendritic cells deriving from the hematopoietic (CSH) strain. In that sense, genetic engineering will be able to develop new strategies to combat HIV through intracellular immunization, the selective destruction of infected cells, the secretion of inhibiting proteins, the genetic pharmaceutical modulation and genetic immunotherapy. But all this requires, first of all, a sound knowledge of a whole series of mechanisms: HIV vital molecular mechanism, its viral pathogenic mechanisms, the innate and acquired immunologic response mechanism against HIV, the differing progression mechanisms of the disease according to individuals and finally, the mechanisms for destruction of reservoirs which are virus sanctuaries. Undoubtedly, these types of fundamental research will contribute to redefine new therapeutic and prophylactic strategies.

### HIV prevention

In the world, the number of HIV/AIDS infected people went from 34 million in 2011 to 35.3 in 2012<sup>1,11</sup>. The number of new cases of infection is estimated in 2012 to be 2.3 million<sup>1</sup>; the number of deaths were 1.6 million<sup>1</sup> and there were 16.6 million orphans in 2009<sup>12</sup>. Without prevention, the HIV/AIDS pandemic would spread exponentially in the world through sexual, vertical and parenteral transmission.

Prevention presupposes the inhibition upstream of the three main transmission ways of HIV: Fidelity, abstinence and sexual hygiene can significantly limit HIV transmission by sexual contact. In addition, it is to be noticed that a good biomedical practice would also limit not only nosocomial infections in our care units, but above all the parenteral infections through human biologic liquids during deliveries and the milk from breastfeeding. At the world level, programs of mother to child transmission prevention of HIV (MTCT) through administration of ARVs have shown their efficiency. With prevention, less than 1% women transmit the virus to their children.

## **HIV/AIDS DEFINITION AND ETIOPATHOLOGY**

Nowadays, all the scientists agreed to define the Acquired Immunodeficiency Syndrome as being a sexually transmitted affection, caused by the Human Immunodeficiency Virus. For methodological reason, biomedical researchers have well characterized and defined the HIV structure, its genetic variability, the etiopathogenesis of the disease generated, and have determined the different phases or classes of the AIDS stage.

### **HIV Structure**

The Human Immunodeficiency Virus is a retrovirus having 0.1  $\mu\text{m}$  diameter, from the Lentiviridae subcategory which has a two ARN molecule genome (Ribo-Nucléic Acid). HIV is composed of: An envelope: p 120, p 41 glycoproteins and a double layer of phospholipids; A matrix constituted of p 17 glycoproteins; A capsid constituted of P 24 glycoproteins containing: two ARN filaments of around 9200 bp wrapped by the nucleocapsid (protein p 7), the reverse transcriptase, the integrase, protease and the ribonuclease. Nine (09) genes among which three structural ones (gag, pol and env) and six of regulation (vif, nef, vpr, vpx, tat and rev).

### **The genetic variability of HIV**

HIV is a virus, which has an important genetic variability. HIV-1 has four (4) groups: M for Major: it is the one responsible for the current pandemic. The group

M is subdivided in 9 subcategories (A, B, C, D, F, G, H, J, K) and today there are 61 recombinant forms. N for Non-M and Non-O. O for Outlier. P, new variant close to group O.

As for HIV-2, eight subcategories have been identified to date (from A to H).

## **HIV definition and etiopathogenesis**

AIDS deriving from HIV-1, is characterized mainly by a slow and progressive diminution of lymphocytes TCD4+ circulating in the organism infected by the virus. The lymphocytes T are with the lymphocytes B, the monocyte-macrophages, the killing cells NK (*Natural Killer*), the *Cytotoxic Lymphocytes T* (CTL) and the granulocytes, the main actors of the immune system. As every infection, the HIV-1 progression in the organism depends on the interaction between the virus and the host. AIDS corresponds to the symptomatic phase of the HIV infection that comprises three main phases.

*The primary-infection.* An acute pseudo-mononucleosidic syndrome appears in certain persons 2 to 6 weeks after the HIV contamination. This syndrome is characterized by the appearance of fever, articular pain, myalgia, diarrhea and a maculopapular rash.

*The asymptomatic phase.* This phase is characterized by a visible absence of clinical manifestation during several years in the LTNP (*Long Terms Non Progressors*: slow progressors) and 2 to 3 years for fast progressors. In the absence of any treatment, this latent period can last 8 to 10 years, even more. Human beings are born equal in right and dignity but they are not born equal for HIV infection. People having mutated co-receptors such as CCR5 $\Delta$ 32 resist HIV infection. Individuals having HLA- $\beta$ \*57 alleles develop AIDS more slowly.

*The symptomatic phase (AIDS).* It is characterized by a very serious immune depression ( $<200 \text{ CD4/mm}^3$ ) and the appearance of opportunistic germs: tuberculosis, oesophagus or airways candidiasis, extra pulmonary cryptococcosis, *Pneumocystis carinii* pneumonia, atypical mycobacteria infections, tumors (Kaposi's sarcoma,) and neurologic manifestations (cerebral lymphoma).

To assess the progression of the HIV infection, based on the clinical manifestation and the biological anomaly, the WHO and the CDC (*Centers for Diseases Control*) of Atlanta propose respectively clinical phases (1, 2, 3 and 4) and categories (A, B, C and D). It is necessary to specify that the CDC classification is hierarchical and historical. According to this hierarchy, once a patient has reached a category, and if the clinical signs disappear, he stays in this category. For example, a patient categorized B will not be able to go to class A, even though the clinical signs have disappeared.

As it appears from what has just been said, the objective of finding a sound vaccine or treatment against HIV still seems away. And, in this anxious search, only efficient cultural, biomedical, ethical and bioethical options can permit human kind to engage, collectively and in solidarity, a new type of struggle to safeguard and protect our human community through adopting responsible human behavior<sup>13</sup>.

## **HIV BIOETHICAL ISSUE AND AIDS TODAY**

### **HIV prevention ethics**

HIV does not need a particular passport with a specific visa to go from one country to the other nor to circulate from one continent to the other. In a globalized world, the AIDS virus flourishes and becomes a free citizen of the world. The only way to stop it is prevention.

#### **Plural bioethical vision of AIDS prevention**

The ethical appreciation of an action is not always easy since the elements to take into account are so numerous that we do not always know where to start. So, there are different ways to conceive the ethics and to advise people, according to the principles one follows in his own judgment. In a variety of bioethical conception and vision, it appears clearly that the practice and respect of ethical standards would depend more on the philosophical, anthropological conception of the person observing and interpreting the fact. There are mainly three trends backing, each, a different viewpoint: the

liberal trend, the pragmatic and utilitarian trend and the personalist trend.

#### **The liberal trend viewpoint**

The ultimate reference value for this trend is freedom. In this perspective, everything that is freely desired, freely accepted and does not affect other people's freedom is allowed. This trend draws its origin from the French revolution, Popper's subjectivism, Jean-Paul Sartre's existentialism, Marcuse's liberalism and Hume's empirism. For the supporters of this current, moral judgment is subjective; there is no objective truth because ethics is not a positive science. In this sense, as far as HIV/AIDS epidemic is concerned, this viewpoint opposes all the restrictions to individual freedom. The prevention in this perspective aims mainly at informing people of hygienic prescriptions formulated by health facilities: diminish the number of partners, avoid high-risk partners and always use a condom.

#### **The pragmatic and utilitarian trend viewpoint**

What is essential and of reference in this current, is what is "useful". The utilitarian trend gets its inspiration from Hume's, Hobbes's, Locke's philosophy and Auguste Comte's positivism and neo-positivism. The in-depth criterion of this philosophy is utilitarianism, based on the principle of cost/benefit and its aim is to promote social, even economic wellbeing. The neo-utilitarians get inspiration from Bentham and Stuart Mill and their thought is summarized in their precepts: "Optimize pleasure, minimize pain and increase the sphere of personal liberty for the highest number of people". In this utilitarian perspective, society desires, on the one hand, that the spread of AIDS be controlled and, on the other hand, considers that individuals are not capable of restricting themselves to avoid "high-risk" behavior, and then proposes "safe sex".

#### **The personalist trend viewpoint**

The advocates of this current defend that the ultimate reference is the human being who is considered as a whole, with his freedom and his responsibility, his social value, his relationships with the others. As for

AIDS prevention, the commitment of this viewpoint is to put the focus not on a short term efficiency of one or the other method, but on the impact that each method will have on the individual and his increase in humanity. That is why, in the personalist perspective, the aim will not be only to avoid HIV infection but to adopt a life style that will permit to avoid the infection.

So, for the personalist model, the central and fundamental value in the AIDS phenomenology is the human being: a "*psychosomatic being*". It is for this suffering body and at its advantage that is developed and converge prevention, screening, all the medical care, the pharmaco-clinical experiments, the health works, the psychological assistance and the social services.

### **Prevention of mother to child transmission of HIV (PMTCT)**

The prevention of the mother to child transmission of HIV is a prevention program, which is even more complex than the one implemented in the population in general. Indeed, the PMTCT implies not only the couple's husband-wife, mother-child but also a multidisciplinary medical staff (doctors, pharmacists, biologists, midwives, nurses, psychologists, etc.) and requires a laboratory facility for PCR tests.

The PMTCT process comprises mainly five steps: voluntary counseling and testing (VCT) which is a pre-test counseling; the screening test itself; a post-test counseling; taking care of the HIV positive pregnant woman through HAART; a clinical monitoring and an ARV prophylaxis for the children born from infected mothers. In all these steps, there are many bioethical challenges such as: the ethics of pregnant women screening, the issue of the free and informed consent, the professional secret, the confidentiality, stigmatization, discrimination, ARV prevention with its risks of secondary effects, the induced resistance, etc.

### **HIV screening ethics**

#### **The issue of HIV screening ethics**

When the epidemics of cholera, plague, meningitis, Ebola occur, the health authorities put in quarantine

the infected individuals to prevent them from contaminating the rest of the population. So, in isolating and taking care of the infected individuals, the transmission chain of the pathogenic agent is broken (isolating room of Ebola, sanitarium for tuberculosis etc.). In these circumstances, nobody speaks of stigmatization or discrimination for individuals infected by Ebola or cholera. However, the HIV epidemics as all the other epidemics pose to health authorities a dilemma, a conflict between, on the one hand, the necessity to protect the population health in general and, on the other hand, the necessity to protect people as free individuals having rights (Papal Council for the family). So, there is inside the society an opposition, a confrontation between safeguarding individual freedom and the necessities of the public good in terms of HIV infection. In the case of HIV infection, the contamination prevention through screening of contaminating people and their isolation are not acceptable for all the members of the civil society since, potentially contaminating individuals are often asymptomatic and so, in good health, working, having income and facing their families' economic expenses. In addition, today, an obligatory screening for HIV during recruitment or on entry of every patient in health units is not acceptable because these infected individuals will be immediately stigmatized, discriminated and consequently they will not be able to neither live in peace nor find a job. However the screening is mandatory for the following cases: blood and sperm donation. For the reasons mentioned earlier, the HIV tests are still, to date, only voluntary and cannot, in any case, be imposed. Nobody can be submitted to an HIV screening test without having given first his free and informed consent.

#### **Necessity for HIV screening in public health**

During epidemic eruptions, the health authorities have the duty to carry out, here and there, epidemiological surveys in order to define the epidemic profile, its origin, virulence, spreading modes and in the case of AIDS, determine the contagious persons, HIV "reservoirs".

In addition to the need for the public health authorities to know the HIV infection mechanism, the screen-

ing is done for the benefit of the individuals. Indeed, the persons diagnosed HIV-positive can benefit from antiretroviral treatments (TARV) whereas those who are found HIV-negative can be well situated in their lives and keep their negative status forever. In that sense, it would be good to promote HIV screening for couples preparing for marriage or for pregnant women to avoid the mother to child transmission.

### **Free and informed consent and HIV screening for pregnant women**

The free and informed consent is the corner stone, the standard for the ethical conformity of the HIV test for pregnant women. The principle of the free and informed consent and the organization of voluntary HIV screening for pregnant women aim at permitting the empowerment of the potential patient and her care and medical treatment. In a clear cut way, at the Bangkok conference, in 2004, ONUSIDA and WHO announced a major change in the HIV screening policy. For them, the “*voluntary counseling and testing (VCT)*”, symbol and mainstay of the liberal paradigm for the struggle against the epidemics was becoming subject of debates on the way to make its access more universal. From then on, for them, for the “*scaling-up*” of the access to treatment in countries where the majority does not know their status, each contact with the health system should be a systematic access to HIV screening. In this sense, according to WHO, any patient seen in medical consultation, in a country with high prevalence where antiretroviral treatments are available, must systematically undergo an HIV test. This new strategy of systematic promotion is known as “*opt-out*” in the sense that the patient remains free to refuse, but no longer “*opt-in*” since he is no longer the one asking for it<sup>14</sup>.

Taking into account this new vision of WHO and expecting all pregnant woman to be compulsorily screened for HIV, during the prenatal visits, could in some cases lead us to an ethical loss of control, in practicing tests without free and informed consent or without patients knowing it. In the cases where the tests are done

without the patient knowing it, it will be difficult, later, to implement the ARV prevention.

### **HIV screening ethics: medical secret and medical care**

Every human being has the right to respect of his dignity, private life and what is confidential to him. Here is the ethical principle of the respect for the “privacy” of human being. So, this principle obliges doctors and all the health professionals, without exception, not to reveal anything concerning the intimate life, the private life of a patient’s health, except if the latter gives his consent to reveal it. In this regard, every violation of professional secret, of this confidentiality, by a doctor, can be object of proceedings and judicial sentence for violating medical confidentiality. However, it must be specified that for AIDS, medical secret is required but it is not absolute. It is limited by the personal interest of the patient, other people and population’s good.

If for example, a pilot of a big plane as the BOEING 747 has an epilepsy, and despite the advice of his doctor he does not want to stop piloting, this doctor despite the medical confidentiality has the right and duty to denounce his patient.

In the AIDS domain, if for example a person is HIV-positive and does not want to tell his serology to the spouse despite the multiple advice of his doctor, what is to be done? The doctor, patiently, must press the person to reveal his status to the spouse. If the patient refuses or promises to do it but does not actually do it, the doctor’s hands will be tied facing this dilemma. Must he break the confidentiality to save the life of the spouse or must he keep the later ignorant of the status and condemn her / him to be infected? According to the 39<sup>th</sup> World Medical Assembly (WMA) in Madrid (Spain), in 1987, the doctor can give up professional confidentiality and inform the authority if the attitude of the AIDS patient seems dangerous for those around him. So, the most frequent obligation mentioned in favor of giving up confidentiality is the one of “assistance to a person in danger”. The guilty silence of the doctor might be interpreted as complicity. The principle to be

followed in this case takes into account the hierarchy of values. So, human life which is not negotiable has precedence over the right to privacy. And when maintaining professional confidentiality endangers someone's life, this confidentiality law becomes null and, as a result, can no longer bind anyone.

### **Research and clinical tests ethics**

Biomedical research is an absolute necessity related to the emergence of new diseases, epidemics, development of resistance to antibiotics, the persistence of non-curable pathologies such as AIDS. The subject of the biomedical research can then be defined as seeking to improve diagnostic, therapeutic and prophylactic methods and the understanding of the etiology and the pathogenesis of diseases<sup>15</sup>. Medical science, as it is constituted since antiquity, has always aimed at efficiency rather than philosophical and rhetoric speeches. The practitioner performs actions which are beneficial to the patient and provides him few words. What was fundamental for the Hippocratic medicine and is still very relevant today is this motto: "*Primum non nocere*" which means, "first, do not harm". This indicates, on the one hand, a respect for the physical integrity of the patient and, on the other hand, the search for his recovery using new treatment methods.

It is then the duty of the researchers and the moral obligation of the scientists to carry out appropriate clinical experiments on animals and humans so that biomedical science can make progress<sup>16</sup>.

This being said, everything that applies to the biomedical research or pharmaco-clinical experiment in terms of ethics, applies to the clinical and biological research on HIV. The ethical standards which resulted from Nuremberg and the Helsinki declaration are its key elements and foundations. Any research on HIV or on AIDS implying human beings must take into account these five essential ethical principles: respect of human dignity, beneficent character, non-harmfulness, autonomy and justice. In addition, the researcher who carries out pharmaco-clinical investigations in HIV-positive patients should, first of all, have the authorization of a

Committee of ethics in charge of health research. The researcher will engage not only in applying the correct norms in clinical practices (BPC) and correct norms in laboratory practices, but also engage in respecting confidentiality and medical secret, once the free and informed consent of HIV infected patients is obtained.

### **Issue of production and commercialization of ARVs**

Currently, more than 40 million people worldwide are infected by AIDS. Despite the international mobilization, in 2012, 9.7 million people underwent an antiretroviral treatment in low and intermediary income countries, which amounts to 61% of people entitled to it according to the 2010 HIV guidelines of the World Health Organization (WHO). According to the 2013 guidelines, only 34% got covered (32-37 %) of the 28.6 million people entitled to the treatment in 2013<sup>1</sup>. To develop the access to AIDS medicines in developing countries and in order for every country to implement a national program for access to treatment, it is necessary to benefit from low cost ARVs.

"Man is a cure for man", says the popular wisdom. For ARVs to reach every part of the world, more solidarity will have to be fostered among human beings. The World Trade Organization (WTO), the WHO, the drug Firms, the Laboratories, the political authorities and the researchers should work in collaboration and synergy.

### **CONCLUSION**

Over the last 30 years, man encountered a major violent adversary, HIV, which is a retrovirus with neither scruples nor wisdom, infecting blindly and without discrimination its victims: man or woman, newborn or elderly, rich or poor, non-believer or man of God. Biologically and strategically, to date, HIV has defeated the "*Homo sapiens*" since it routed his immune defense system, and resist antiretroviral drugs. But sooner or later, culturally, thanks to his science, modern biotechnology and his organization capacity, man will overcome AIDS. So, as the ploughman was telling his kids in La



Fontaine's tales, the searchers for drugs and vaccines against HIV, before reaching victory over this pathogenic retrovirus, should undoubtedly "*dig, search, turn over, leaving no place where a hand does not pass again and again*". It is at this cost, and with the invaluable assistance of international organizations, the United Na-

tions and Countries, that the researchers will be able to overcome AIDS forever! Armed with this hope, we dare believe that future generations will not face HIV and as a result, will only talk about it as a past event, and will only study it in their history books and encyclopedia. Yes, "*AIDS, we will overcome it!*"

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