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A Global Emergency

THE HIV/AIDS AND TUBERCULOSIS EPIDEMICS

IMPLICATIONS FOR TB CONTROL

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INTRODUCTION

1. The Human Immuno-deficiency Virus (HIV) and tuberculosis (TB) present a public health challenge unlike any other faced this century. Illness and death attributable to both causes are already large and worsening. Both are becoming increasingly costly to deal with. In an environment of resource scarcity governments are attempting to ascertain the most effective way to proceed. In response to requests from countries and from its technical and management advisory groups the WHO TB Programme in coordination with the Global Programme on AIDS (GPA) has developed this paper to summarize the current state of knowledge about how best to deal with TB in circumstances where HIV is prevalent or emerging. It has been reviewed by the advisory committees of the TB Programme for circulation as a discussion document to Member States and other Interested Parties. It does not attempt to be encyclopedic in its coverage or directive in its conclusions. In some areas of the world TB is worsening as the result of HIV's impact, in other areas this has not yet occurred. In light of this, the paper (i) assesses the background and trends of the TB and HIV epidemics, (ii) synthesizes the recommended approach to TB control; (iii) discusses the interaction of HIV and TB and their impact; (iv) outlines the main programmatic issues for TB treatment in HIV prevalent settings, and (v) proposes an agenda for collaboration of national TB programmes with national AIDS programmes. Suggestions

for improvements and changes to this document before the end of 1994 are requested from interested readers so that the Programme can formulate policies and specific advice which reflects the realities of a wide variety of conditions faced around the globe.

2. The HIV epidemic heightens the need to focus on the identification and successful treatment of infectious TB patients. Any TB programme weaknesses are exposed where HIV is prevalent and are indicated by increases in TB cases and mortality. Where HIV-related TB is overburdening general health services it seriously detracts from many public health objectives and programmes. At the primary level many extremely important health services must be maintained but TB is already so serious in many places, and its interaction with HIV is so significant, that national and local governments, as well as donors, may have no effective alternative but to provide increased staff and resources to preserve services and morale, or TB deaths will increase and credibility of the health system will be undercut. Unfortunately, the TB epidemic has not yet been seen by many governments or donors to be sufficiently serious, or amenable to effective attack. Indeed, in most parts of the world the TB epidemic has been drastically under-funded and left to become inefficient as a result of neglect and the allocation of resources to other health needs.

I. THE EPIDEMIOLOGICAL TRENDS OF THE TB AND HIV EPIDEMICS

3. For 400 years or so the world has been in the grip of the TB pandemic. Over the last 20 years the HIV/AIDS epidemic has emerged and directly touched communities throughout the world, though with vastly different intensity as both the epidemiology of TB and HIV/AIDS varies widely around the world and the capacity of health systems is markedly different. Overall, TB is increasing in prevalence and incidence. For HIV/AIDS prevalence is stabilizing in some countries while incidence is increasing in younger age groups. Overall AIDS cases are expected to increase. During the last decade the complex interaction of TB and

HIV/AIDS has become increasingly important in a few, but increasing number of countries and this trend is expected to continue. With resource shortages for health care in many countries, policy focus has naturally turned to making HIV and TB **prevention**, AIDS patient **care**, and TB patient **cure** as effective as possible. Communities, governments and public and private health and development agencies are examining how TB and HIV/AIDS interventions might be conducted and coordinated to maximize their impact.

4. The TB Epidemic. *Mycobacterium tuberculosis* has penetrated all societies in the world, resulting in about 1,700 million people (one-third of the world's population) being infected with the organism. Each year some 8 million of these develop TB and around 2.9 million currently die from it. In order of priority, the adverse effect of poor quality TB programmes in many countries, rapid growth of the world's young adult population who have been infected with the germ, and the effect of HIV to increase incidence of disease are worsening the situation. About 10.2 million cases of TB are expected to occur by the year 2000. Without more effective treatment of TB, deaths could rise to 3.5 million annually by the end of the century. Cumulatively for the 1990s nearly 90 million new cases and 30 million deaths from TB will afflict the world, with a disproportionate share of this burden falling on the poorest countries, and within them, the poorest communities.

5. The HIV/AIDS Epidemic. The extensive spread of HIV appears to have commenced in the late 1970s or early 1980s - in the Americas, Australasia and Western Europe primarily in homosexual or bisexual men and injecting drug users in certain urban areas; and in parts of the Caribbean and East and Central Africa among men and women with multiple sex partners. As of late 1993, more than 15 million HIV infections are estimated to have occurred since the beginning of the pandemic, over 14 million of them in adults. An estimated 12 million persons are currently infected with HIV. There have been an estimated 3 million cumulative adult AIDS cases and this figure approximates the cumulative deaths to date. WHO estimates that during the 1990s around 10-15 million new HIV infections may be expected in adults, mostly in developing countries. During the same period, WHO projects that as many as 5-10 million children will be HIV-infected at or soon after birth, the majority of them in sub-Saharan Africa. For the decade there will be 30-40 million new HIV infections in men, women and children, of which more than 90% will be in the developing countries. Projected cumulative total AIDS deaths will be close to 10 million (i.e., 7-8 million during the decade).

6. The TB/HIV Co-epidemic. Over 4.8

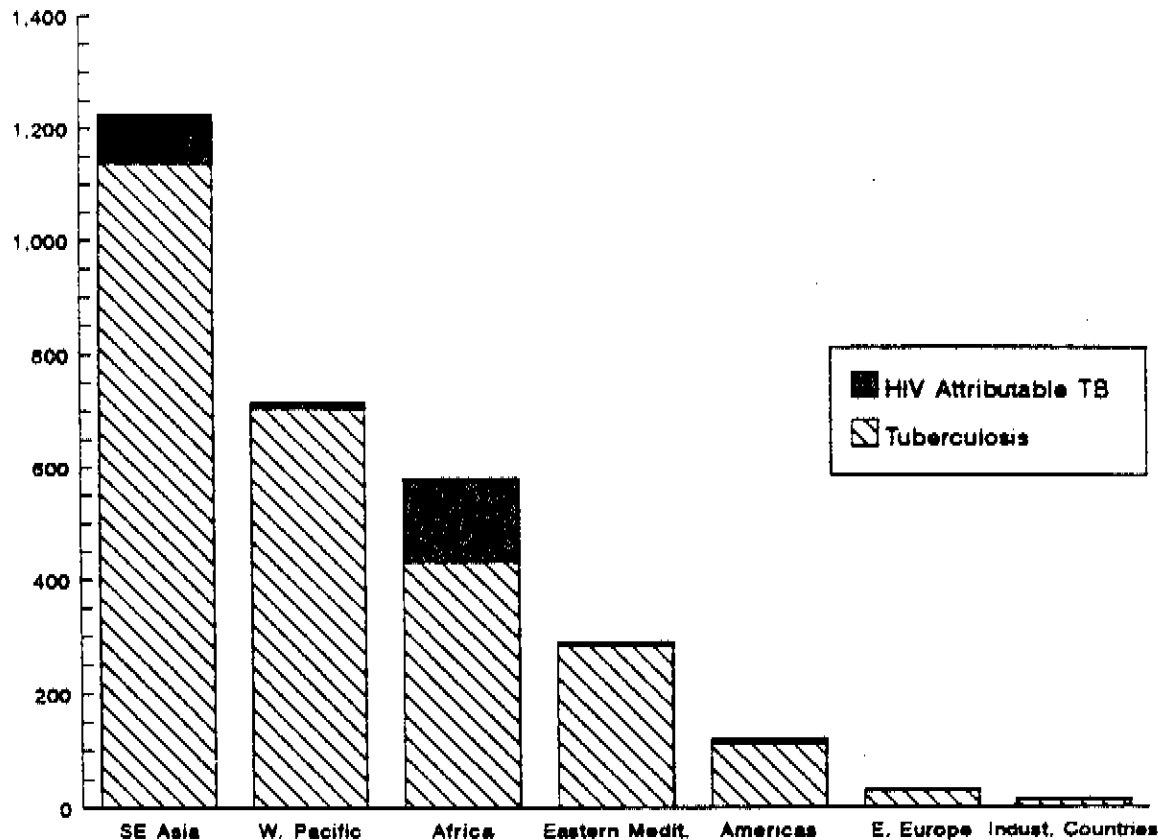
million people are currently co-infected with HIV and TB. New TB cases attributable to HIV co-infection are estimated at 300,000 in 1990 (4% of total new TB cases) and are expected to increase to around 1.4 million cases per year by 2000, equivalent to about 14% of expected TB cases. Because of the higher mortality of HIV-associated TB the proportion of TB deaths attributable to HIV will be slightly higher.

7. The regions of the world, and countries within them, are affected very differently by the co-epidemic. Chart 1 overleaf shows by WHO region the estimated burden of TB and HIV-associated TB at present. Cases of HIV-associated TB are rising faster than cases of TB alone. Africa is obviously the region presently most hard hit. At present, Africa accounts for over 75% of co-infected individuals within the critical 15-49 years of age group. Since two-thirds (1 billion) of the world's tubercle-infected people live in Asia, and since HIV is spreading in that region, Asian Governments cannot overestimate the urgency of strengthening their TB control programmes while redoubling HIV prevention efforts. South East Asia (mainly the subcontinent) will experience a rapid worsening during the decade. Within these regional groupings, a few countries, and within these certain areas and groups will be most hard hit by the co-epidemic. For the world and for most parts of most regions and countries TB not associated with HIV will remain the predominant disease condition to be addressed.

8. Both the TB and HIV pandemics are major public health concerns, each deserving priority on the international health agenda and requiring specific measures for prevention, control and patient care. HIV has been the subject of an intensive international effort aimed at prevention and reduction of personal impact. Tuberculosis is only recently becoming the focus of international concern and only a few developing countries are yet receiving substantial international assistance to strengthen their TB control and prevention efforts.

9. For the time being little can be done to stop the progression from HIV infection to development of AIDS. Research into therapies to slow the progression yield some hope but applications suitable for use in the developing world remain expensive, unsuitable or unproven.

TUBERCULOSIS AND HIV-ATTRIBUTABLE TUBERCULOSIS DEATHS
1995 Estimates, in thousands



That means that good public health policy against HIV and AIDS has to be based on prevention of new infections and supported by good medical policy which aims at cost-effective care of persons already ill with the syndrome. The former has to be rooted in public health education and behavioral change to reduce the risk of infection and through early management of sexually transmitted diseases. Best practices for improved medical care can emerge through identifying, developing and testing specific protocols for the conditions affecting AIDS patients and which take into account the capabilities of the health services and personnel available in each country's setting.

10. It remains uncertain whether HIV-infected persons are more prone to infection with *Mycobacterium tuberculosis*. However, it is clear that if infected, they are definitely more prone to development of active TB. Fortunately, much can be done to reduce the risk of infection with TB and to improve

outcomes in persons who are co-infected with both HIV and TB and then develop TB. The effectiveness with which it is done has enormous consequences for all who come into contact with co-infected individuals because of the probability of further spreading TB infection and the development of multi-drug resistant strains of tuberculosis. It is therefore important for governments, health institutions and health workers to understand the basics of the TB epidemic, the potential for its cost-effective control, and the advantages of the right medical responses where TB-HIV co-infection rates are high or rising.

11. Underlying Causes of the TB Epidemic. The major elements which have combined to create the present global TB emergency are four:

12. First, TB is infectious; it is casually transmissible by the airborne route; few effective measures can be taken by individuals to protect against infection. TB is transmitted only by

people suffering from the disease. The larger the pool of infectious sources in a community the higher the risk of disease transmission to uninfected individuals. Good quality TB programmes and medical practices can cure almost all detected infectious cases. Poor programmes often fail to cure even half of such cases. However, poor programmes do succeed to keep infectious people alive longer and thus increase TB transmission. Simply put, poor quality TB programmes and treatment practices make the TB epidemic worse than if nothing at all was done because they increase the pool of infectious sources in the community. TB control and prevention must start with the effective treatment and cure of the individual patient who both presents the risk (of infection) for the community and is at risk (of death) himself.

B. Second, demographics play a major role. The numbers of people who are infectious, and thus the size of the TB epidemic, are increasing. People over 15 years of age have been increasing in numbers and growing as a share of the total population much more rapidly than in the past because the causes of death in childhood have been remarkably decreased and the probability of survival through young and middle age to old age has dramatically improved. The result is that there are many more young people and adults alive today. Since many of them were infected with TB during childhood there today are many more cases of TB emerging, even if the rate at which disease occurs remains stable or even moderately declines.

C. Third, the HIV epidemic has changed the epidemiological equation for progression from TB infection to TB disease. Because HIV weakens the body's immune response which usually keeps TB infection dormant throughout life in over 90% of infected individuals, HIV greatly accelerates the progression from infection to active tuberculosis disease. It thereby increases the incidence rate for TB, especially in young and middle aged HIV-infected adults, and thereby also increases the pool of infectious sources. Further, because the immune response of HIV-infected persons is reduced, TB infection leading quickly to serious disease also causes death rates from TB to sharply increase in the absence of effective medical response, thus potentially damaging the credibility of the health

services, particularly for TB treatment.

D. Fourth, overlaying this whole pattern, social and economic trends may have exacerbated the spread of TB. In the past, relatively little national and international labour mobility, only moderate global migration, and relatively difficult and slow transportation within and among countries meant that infectious cases of TB had limited contacts. At the end of the twentieth century, labour, migration and refugee movements are occurring in greater numbers than at any time in history. Modern transportation has ensured wide opportunities of contacts for infectious TB cases. Economic recession and accompanying political shifts have in some countries caused cut-backs in social services, de-emphasis of public health and a weakening of health services. These factors have been acknowledged in some industrialized countries as worsening the TB epidemic. In other places such factors may have exacerbated use of inappropriate treatment practices and raised financial barriers for the poor to gain access to services for TB.

13. The Emergence of Drug Resistant TB. Poor TB programmes and treatment practices also create TB strains resistant to one or more of the main drugs used to treat TB. This disastrous occurrence turns an easily and inexpensively curable disease into an expensive, potentially incurable one. Strains of TB resistant to several anti-TB drugs (MDR-TB) do not occur and develop naturally. This happens solely as a result of the bacillus being subjected to inappropriate or ineffective chemotherapy practices, either as a result of practices by the physician or the patient, or both. MDR-TB is a wholly manmade problem and it has been well-known for three decades how to avoid it. However, the emergence of MDR-TB is of urgent public concern because it is also casually transmissible. Physicians and health workers (and anyone else in even indirect contact with a drug resistant case) are at risk of developing incurable disease. This fact underlines the overriding importance of TB programmes, and TB treatment practices in any health care setting, being able to achieve and prove high rates of TB cure (and thus avoid development and transmission of MDR-TB). It is especially true in HIV-prevalent settings because of the rising number of HIV-associated TB cases which will,

if inappropriately managed, also have the potential for development of MDR-TB.

II. PRINCIPLES AND STRATEGY OF TUBERCULOSIS CONTROL.

14. The aim of TB control programmes must be to reduce mortality, morbidity and transmission of the disease from infectious cases to their contacts, ultimately thereby reducing the incidence of the disease and the risk of new infection until TB no longer poses a significant public health hazard. Where TB prevalence has already been reduced to very low levels, and if resources are sufficient, this basic control strategy can be supplemented by preventive chemotherapy of infected (not yet diseased) individuals to sterilize their TB infection.

15. The WHO recommended strategy to reduce the incidence of TB is to detect by sputum smear examination and cure by effective short course chemotherapy as many infectious cases as possible. The basic elements of the WHO-recommended policy for TB control are the same for countries with both high and low prevalence of HIV and can be summarized, in brief, as:

- * Government commitment to a TB programme aiming at nation-wide coverage, as a permanent health system activity, integrated into the existing health structure with technical leadership from a central unit.
- * Proper identification and treatment of infectious (sputum smear positive) cases. Case detection should normally be through passive case-finding, that is the detection of sputum smear positive cases among those persons who present to the health care system because of symptoms. If resources permit,

infectious cases can be identified also by culture after microscopy to identify more cases which have the likelihood of becoming highly infectious.

- * Supervised administration of short course chemotherapy with rifampicin containing regimens meeting WHO recommendations to at least all sputum smear positive cases.
- * Accurate registration of each patient, with monitoring and regular evaluation of the progress during treatment and outcome of each case and with careful classification into new and previously-treated cases for the purposes of regimen prescription and for cohort evaluation of treatment outcomes.
- * Maintenance of a regular drug supply of all essential anti-TB drugs.

16. Already these elements are being successfully applied by a number of national TB programmes in developing countries. The interplay of HIV and TB do not alter the principles or techniques for the control of TB, but HIV quickly exposes any inadequacies in TB control because it compromises immune response and telescopes the rate at which disease develops. It is critical therefore that governments act to ensure that good TB control practices are in place and are strengthened, if at all possible before the HIV epidemic progresses.

III. HIV-TB INTERACTION AND IMPACT

17. Increased TB incidence. The most important impact of HIV on TB is that it increases incidence in two ways: by substantially increasing, among persons infected with *M. tuberculosis*, the proportion which develops

active disease; and, by greatly decreasing time between infection and the onset of disease in persons recently infected with TB. Both of these effects also increase the number of infectious TB

sources and thus also further increase the probability of transmission. However, since HIV positive persons may be more likely to have HIV positive social contacts than the general population, development of active TB by an HIV positive person poses a special need for prompt, effective treatment both for that patient's own well-being and to reduce the risk of infecting with TB any HIV positive contacts.

18. Increased TB Mortality. HIV increases TB mortality dramatically because it suppresses immunity. Where TB infection rates are high (e.g., much of Africa, and most of Asia), newly acquired HIV infection triggers previously dormant TB to emerge as open disease which can progress relatively quickly to death within a few weeks to a few months. Conversely, acquisition of a new TB infection can dramatically shorten the period of healthy life in an HIV positive person if prompt and effective treatment is not provided. Effective treatment of TB is highly beneficial to prolong healthy life in HIV infected persons. Prevention of HIV infection in populations with high prevalence of TB infection can help to reduce the number of new TB cases and subsequent deaths.

19. Impact of HIV-Associated TB on Health Services. HIV is a major cause of the large increases in incidence of TB seen in a number of sub-Saharan African countries, and is heavily implicated in the rise seen in the USA and some cities in other regions, but has been only of marginal impact elsewhere. Some African countries have seen a 3 or 4 fold increase in TB case notifications and deaths as a result of HIV-associated TB. The result is a major strain on health services, including TB treatment services, especially in large towns and cities. The capacity of general in-patient and out-patient clinic services, of special infectious disease wards in hospitals, of both general and special drug supply systems, and of primary care clinics, and most of all smear microscopy within the general health services, have been outstripped in places. TB diagnosis and treatment practices which save staff time and reduce demand on facilities and laboratories have been introduced as emergency measures to cope with demand. For example, providing trials of anti-TB drugs to patients to see if their health improves has sometimes been attempted to obviate the need for diagnosis. TB treatment

is sometimes started solely on the basis of clinical symptoms. Efforts to properly classify cases for purposes of determining correct regimen, registry of cases to ensure tracking of their therapeutic progress, and overall monitoring of cohort progress and performance of treatment have surely been neglected in these efforts - indeed, in most places TB aspects of health services had been so neglected that these crucial elements were weak or non-existent prior to HIV's entry into the picture.

20. The result is that practices are being followed in many places which will cause TB treatment failures, and thus further transmission of TB and creation of multi-drug resistant TB strains. The situation exacerbates the inappropriate use of scarce drugs and staff resources on cases who are either not ill with TB, or fail to be cured. Some TB programmes and primary health services carry on their work with little or no increase in staffing or financial resources despite a high and rising TB and HIV burden. Such situations will inevitably worsen the TB epidemic and increase demands and cost for care of patients.

21. In some settings, mainly in sub-Saharan Africa at present, an increase in TB programme staffing, training and funding may be essential to restore and then maintain TB control activities in the face of the HIV epidemic. Particularly in general clinical and health service settings where HIV is prevalent, there is an urgent need for development and testing of effective diagnosis and treatment protocols for both TB, and other opportunistic infections which often overload health service staff and institutional capacities. In some communities, home-based AIDS care programmes may more effectively deal with the consequences of the HIV/AIDS pandemic. These arrangements should be developed and implemented consistent with WHO's recommendations for effective TB control, the classification, diagnosis, treatment and supervision of TB patients. Home-based care must be evaluated from the beginning to ensure properly documented high rates of cure of TB or these well-intended efforts may easily make the TB epidemic worse and spread the disease to families and communities hosting home-based care activities.

IV. KEY ISSUES FOR TB TREATMENT IN HIV PREVALENT SETTINGS

22. HIV-related TB Diagnostic Problems. WHO recommends that TB diagnosis relies on sputum smear microscopy, supplemented by radiography and clinical evaluation. Microscopy has the overriding advantage that it detects the cases of public health importance - the infectious cases. This is also true in HIV-infected patients.
23. WHO stresses the importance of correct classification of diagnosed smear-positive TB cases as new or retreated. The latter, having been treated before for TB, have a probability of having already developed resistance to at least one drug and must receive a stronger regimen than the case which is being treated for the first time. Careful questioning of the patient, and preferably, rigorous use and maintenance of TB microscopy and patient treatment registries are means to ensure proper case classification.
24. HIV-positive TB suspects pose unique challenges for diagnosis. The main problem is that sputum smear negative TB is much more common in HIV patients. The sputum smear may also be less sensitive in HIV positive patients. Moreover, some sputum smear negative (HIV-positive) persons have HIV-related symptoms similar to the signs of TB, but do not in fact have TB. TB treatment of these persons drains resources and staff time needed to deal with infectious TB patients. Improper classification of such patients pose both present and future risks. Together with failure to maintain and use TB registries to record and evaluate patient progress, misclassification of TB suspects deprives the health services of the most effective tools which they have to control the TB epidemic.
25. The increases in TB incidence stimulated by HIV tends to cause "false negative" diagnosis to increase because, without greater resources, smear microscopy services must reduce time and attention spent examining each sputum smear slide. Some of these false negatives are, in reality, sputum smear positive (some new cases and some retreatment cases), and will, if treated with an SCC regimen designed for smear negative cases, receive clearly inadequate therapy, run the risk of remaining infectious and, if supervision of their therapy is inadequate to detect the need for a change of treatment, have a strong chance to develop and transmit MDR-TB.
26. Chest radiography (X-ray) does not provide a good alternative method of TB diagnosis. It is sensitive to diagnose TB but not specific. It is not recommended by WHO as the main diagnostic tool in high TB prevalence areas, many of which also face rising HIV prevalence. Further it is even less specific, and may also be less sensitive, in the diagnosis of HIV-associated TB. It cannot therefore be used in preference to the sputum smear to diagnose HIV-associated smear positive TB but it may provide a useful complement to good microscopy in some settings. However, clinical diagnosis based on X-ray examination in sputum smear negative patients should always be made by an experienced medical officer to avoid misclassification and mistreatment of TB.
27. Increased rates of recurrence. HIV is a major risk factor for recurrence of TB in patients who are misclassified or treated with SCC regimens which do not meet WHO's recommendations. Recurrence is of interest to medical researchers and may be usefully researched and monitored where good TB treatment is being achieved. Where successful treatment rates remain low in the general health services however, devotion of resources specifically to the problem of recurrence will distract from the main task of TB control. It is far more important to ensure that SCC regimens recommended by WHO are adopted in all health services, that secure supplies of drugs are available, and that diagnosis and proper classification of patients results in correct treatment and follow-up monitoring.
28. Avoidance of Thiacetazone in SCC Regimens. Thiacetazone is inexpensive and highly effective as an anti-TB drug in SCC regimens in many populations. It is most commonly used now in Africa and parts of south Asia. It is seldom used in the Americas, the Middle East and Asia and the Pacific. Continued use of thiacetazone where it is now employed can be desirable from two perspectives. First, it is cheap and it is safe to

give in the continuation phase of chemotherapy without close patient supervision, thus resulting in lower overall programme costs. Second, continuation of its use helps to prevent the development of resistance to the mainline medications by ensuring that rifampicin is never used with only one other medication to which resistance may have already developed. However, the toxic effects of thiacetazone - horrifying, painful, often fatal skin defoliation in a proportion of HIV positive TB patients are well-documented.

29. WHO recommends that individuals known or suspected to be HIV infected should not receive thiacetazone because of the danger of potentially fatal skin reactions. However the programmatic response to thiacetazone toxicity continues to pose a difficult problem particularly for sub-Saharan African countries that have high and increasing TB rates and HIV co-infection rates, with severely under-funded health services in general and TB services in particular. The adjustment of the balance between initial treatment regimens and retreatment regimens to ensure the avoidance of creation of drug resistance is greatly complicated when thiacetazone cannot be used. The additional cost of shifting SCC regimens from inexpensive thiacetazone to less toxic but more expensive SCC regimens is viewed as being prohibitively costly for implementation at the programmatic level and it carries with it the management and organizational problems of supervision of alternative SCC regimens when existing TB programmes are weak and under-funded. Gradually in parts of south Asia the same dilemmas may emerge if TB programmes are not sharply strengthened before HIV prevalence rises.

30. Definition of a programmatic response to thiacetazone toxicity as an issue requires that two different shifts in chemotherapy be argued out at the national programme level. Long-course chemotherapy (12 months or more in duration) using thiacetazone with minimal supervision of patients is the cheapest financial approach to TB treatment, but patient compliance and cure rates are often very low. WHO now recommends only the use of short course anti-TB chemotherapy (SCC), but accompanied by all of the other elements which WHO defines as essential for effective TB

control. Of the three alternative SCC regimens recommended by WHO, one includes thiacetazone in the continuation phase. Only a minority of countries in sub-Saharan Africa and South Asia have made a complete shift from long regimens to SCC (some with thiacetazone and some without), with most still using long course chemotherapy in at least some areas and for some patients.

31. In Africa and parts of south Asia implementing SCC, TB programmes with financial constraints have often chosen the cheapest SCC regimen (containing thiacetazone in the continuation phase). As HIV becomes more prevalent, the issue arises of whether and when to make a second shift to a SCC regimen which contains no thiacetazone at all.

32. For countries where HIV has become highly prevalent and which have not yet been able to move most of their patients to SCC, the cost of replacing thiacetazone in their regimens can be a difficult issue. Yet, alternatives are few and impractical - HIV testing and counselling of all patients with suspected TB and the administration of thiacetazone only to those who are proven HIV negative. Another approach to overcome the problem would be intensive education, supervision and logistical support to all primary health workers to ensure that patients with skin reactions are recognized early and that thiacetazone administration is stopped immediately and replaced with another drug. Costs of such training and supervision could be significant and unlikely to be feasible in settings where HIV-induced TB and other AIDS related opportunistic infections are already straining health services.

33. Intuitively it is easy to see that the combined effects of horrendous thiacetazone-induced skin reactions and the large increase in fatality rates among HIV infected TB patients could constitute a major disincentive for TB symptomatic people to seek care, thus further worsening the spread of TB. In countries where HIV is very common and there is only weak capacity for supervision, self-administered ethambutol and isoniazid in the continuation phase may be a wiser choice than continued use of thiacetazone on a programmatic basis. This, however, necessitates a strengthening of the retreatment regimen to ensure that, wherever

rifampicin is given, at least one other medication is given as well which has not previously been given with only isoniazid (to ensure that initially isoniazid-resistant cases do not become dually resistant to isoniazid and rifampicin). In addition streptomycin, a drug administered only via the parenteral route, should be replaced by ethambutol in the initial phase of short-course chemotherapy because of the risks of spreading HIV and other blood-borne pathogens when sterilization of needles and syringes is not guaranteed.

34. Overall, it seems likely that as the HIV/TB co-epidemic worsens in some countries there will have to be a gradual phasing-out of thiacetazone. At what level of co-infection prevalence to do so, and how to undertake good surveillance of co-infection rates and trends remain questions to be researched and debated. However, AIDS and TB programmes, and concerned donors and NGO groups, will have to jointly advocate to national governments and the donor community at large that at some stage there is no ethical alternative to thiacetazone replacement and that resources for drugs simply must be provided to use alternative SCC regimens for TB, including rigorous direct supervision of drug to ensure high cure rates and to avoid emergence of drug resistance.

35. Clinical Management of TB in HIV Infected Patients. Other than the thiacetazone issue discussed above, clinical management of TB in HIV infected patients does not differ from the standardized approaches recommended for TB in general. The problem is that health services in most countries (and some donors) have not recognized this fact and therefore taken action to quickly strengthen workers' knowledge and practices and to expand good TB treatment programmes which satisfy the minimum standards and practices recommended by the WHO.

36. Health service staff who are providing care for the illnesses presented by HIV infected persons will benefit from better training and supervision to manage TB cases. They will be greatly aided by strengthening of TB services at the district level and above to enable their support to primary health services, institutions and private practitioners. The WHO TB Programme, in collaboration with the Global

Programme on AIDS, is in the process of developing and testing protocols suitable for use at various levels and institutions where clinical management of the co-infected patient is presenting major challenges. As these protocols are proven in various settings their dissemination may reduce the burden on health services and improve efficiency and patient outcomes. TB case management in home/community based care settings in some countries without sound national TB programmes and policies may risk adoption of an incorrect or incomplete technical approach. This will make the TB situation worse by producing chronic and possibly multi-drug resistant TB cases. If projects of home/community based care for AIDS patients can be coordinated with projects to properly revitalize and strengthen TB programmes they offer the potential to better identify and help TB patients to satisfactorily complete chemotherapy and be cured.

37. TB Preventive Therapy in HIV Infected Persons. WHO and IUATLD have recently recommended that tuberculin-skin test positive individuals with HIV-infection should receive isoniazid preventive therapy, provided that the individuals have been fully screened to exclude the presence of active TB. Countries with strong TB control programmes and adequate resources to afford preventive therapy as part of public health services may find it to be a valuable additional tool in their disease control approach. In private sector health services, or in public settings where cost recovery practices are effective and do not discriminate against provision of public health goods such as TB treatment, tuberculin skin testing and preventive therapy for TB could be offered on a fee basis to those persons who already know their HIV status and who wish to undertake treatment. However, HIV testing and counselling for the purpose of deciding who should be offered preventive therapy is not recommended by WHO. Further, TB preventive therapy for HIV-infected adults cannot be recommended for broad programmatic use in developing countries as there is not sufficient information on cost-effectiveness and feasibility. Moreover, there is the serious risk that preventive therapy services would distract from the overriding goals for the health services of preventing HIV infections and successfully treating infectious TB cases. Public funding for preventive therapy therefore should not be

contemplated where high cure rates of infectious TB are not clearly being achieved in the general primary health services. The latter must always have first priority compared to preventive therapy in order to affect the trend of the TB epidemic. Continued research into the best methods and the cost-effectiveness of preventive therapy is recommended where resources and programme strengths are adequate. Eventually, preventive therapy may be shown to be feasible on a limited programmatic basis in developing countries.

38. TB Screening and Education. In areas of developing countries with voluntary counselling and testing centres (VCTs) for HIV, screening and education concerning TB should be available. This may require development of appropriate materials and coordination with local TB programmes, and additional funds, training and supervision to Counsellors to fulfill this role. TB preventive therapy could be offered in such settings, but within the cautions outlined above. National TB and AIDS authorities may wish to establish a common position on this possibility so that services which primarily benefit individual patients (preventive therapy) will not absorb the resources that have higher priority use to break the cycle of transmission of TB. Justification of preventive therapy within specific institutional settings (hospital wards with AIDS patients, prisons, or for specific populations, etc.) will need careful evaluation of potential TB transmission benefits if the use of significant public resources is envisaged when resources remain scarce for overall HIV prevention and care and TB treatment programmes.

39. TB Transmission in Health Institutions and To Health Workers. As individuals with HIV may be more susceptible to TB infection than HIV negative persons, HIV positive health

workers may have a high risk of acquiring TB if their work places them in contact with TB patients. Health workers in TB wards or other areas with high risk of TB transmission should be informed about this risk, and where available, voluntary HIV testing and counselling should be discussed. Patients with HIV infection, who are not infected with *M. tuberculosis* may also be at a higher risk than other patients of acquiring TB infection in health care settings. General infection control principles should be implemented as resources permit, including separation of infectious TB patients from other patients in ward and clinic settings. Recommendations on this issue for identification, treatment, isolation of infected patients, environmental control and protection of health care workers and others have recently been published jointly by WHO and the IUATLD.

40. Education about the risks of TB and the value of preventive therapy for health workers is essential, especially in settings where workers may be exposed to many HIV-infected individuals who may develop infectious TB over a short period of time. Health workers employed in countries where poor TB services may have been creating MDR-TB strains are at special risk and they need to advocate rapid improvements in TB control in their own institutions and communities to halt the creation of drug resistant strains. They need to be well educated about their risks of TB infection and steps they may need to take. Especially for those health workers who may themselves be HIV infected, special efforts must be made - both to alert them to the risks and to encourage voluntary HIV testing and counselling so that TB preventive therapy can be offered to individuals already exposed to the bacillus. The basic messages and materials to accomplish these education goals need to be developed and disseminated in national settings by TB and by AIDS programmes.

V. AGENDA FOR COLLABORATION OF TB PROGRAMMES WITH AIDS PROGRAMMES.

41. Well-functioning national TB programmes can collaborate with all parts of a health system to train health workers and support health institutions to deal successfully

with TB in an HIV-prevalent setting. They can help carry out HIV/TB related research. They can join with AIDS programmes to provide training on TB/HIV for primary care workers,

health institution staff and private practitioners dealing with co-infected patients and communities. Where appropriate, they can provide help with TB screening and education for HIV voluntary counselling and testing centers as well as provide technical assistance in establishing preventive therapy programmes in special settings for co-infected persons. In selected settings they can help train health workers with counselling of patients on HIV/TB issues. With AIDS programme staff, they can train health workers to recognize and properly treat opportunistic infections other than TB in HIV infected persons.

42. TB programmes which cannot accomplish their primary task of achieving high cure rates among infectious TB cases are unlikely to be able to contribute much to any of these activities. For much of sub-Saharan Africa and Asia, infection with TB is widespread and common. Currently low TB cure rates and weak TB systems will require urgent and substantial strengthening before co-infection with HIV becomes more prevalent. The need for a period of investment and nurturing of better activities in the general TB health services may be frustrating for those at the country level who are also meeting the current challenges posed by HIV/AIDS. However, in many countries, after years of neglect and inappropriate TB activities in health services and institutions, there is really no practical alternative to a decision to reorient and revitalize TB policies to become much more effective. Fortunately, the evidence is that this can be rapidly achieved using currently recommended WHO strategies.

43. Section IV above contained a number of specific topics on which coordination by AIDS and TB Programmes can help to get across the right practices, training or policy messages. In addition, the major activities at global, regional and country levels where AIDS and TB programmes can collaborate for HIV and TB prevention and AIDS care include the following:

A. Advocacy. The severity and implications of both the AIDS and TB pandemics can be taken into account by the public information and education activities of both national AIDS and TB Programmes as well as on the global level by WHO and other agencies interested in international

health. The objective should be to achieve a good widespread understanding of the burden and the strategy to deal with these epidemics. Policy makers at the country level need a clear conception of how the epidemics interact and the rational steps that can be taken for most effective HIV and TB prevention and treatment and AIDS care. The implications of present inadequate funding at the global and national levels for TB programmes need to be spelled out and consistently portrayed, so that the world community will know how to respond, and will be more likely to do so.

Major impediments to good TB care in general health services include lack of understanding of the WHO recommended approaches to the TB epidemic, the absence of clear and detailed policies at the national and sub-national levels for operation of TB programmes, and lack of local leadership and funding to quickly improve the capacity of TB activities. AIDS and TB programme managers can jointly advocate national and international attention to take the necessary steps to enable better quality TB activities to be established as basic elements of support to national AIDS care projects. The specific needs for health worker education can be part of a joint advocacy/education approach which takes into account the needs of patients, health workers, and the uninfected members of the community. This strategy must also be aimed at the administrators and politicians who ultimately make the political and economic choices of which health activities receive public attention and funding.

B. Training. In most countries, health workers should receive basic information on control and prevention of both TB and HIV and basic information about care for AIDS patients. National TB staff could prepare basic training programmes for health workers to better recognize and know how to refer TB suspects for confirmation of diagnosis and entry to treatment. Likewise, they could prepare training programmes for TB workers at district and national level to be

knowledgeable about and able to provide better technical and supervisory support to general health workers dealing with HIV/TB cases. At the WHO regional/intercountry level, national TB programme managers and national AIDS programme managers should meet to exchange experiences, materials and insight into problems and successes, and to define further areas where collaboration between the programmes at the district level and above can enhance the support available to health services and health institutions to deal with appropriate prevention and care activities.

Where there is a high or rising level of HIV infection and TB programmes are being strengthened, training on HIV issues could productively begin to be provided to district and higher level TB managers.

C. Improved AIDS Care and Prevention of Associated TB. AIDS programmes are exploring different options to cope with the large increase in AIDS cases predicted in many areas. This includes development of home or community based care programmes for AIDS patients which may be complementary to hospitalization. The objective is to provide low cost, humane and effective care for the growing numbers of AIDS patients in many poor communities, particularly in Africa. There could be considerable benefits of unburdening the health system from some of the heavy demands posed by AIDS patient care in clinical settings and of avoiding new investment in higher level facilities to meet the AIDS care demand.

AIDS patients have an exceptionally high risk for developing TB. It will therefore be imperative that good quality TB services are available to support development of home care programmes. National TB Programmes should help to determine the best method for direct observation of chemotherapy and its recording and reporting in home care settings. TB programmes should also be involved in designing and supervising technical, patient and family TB education for the health workers undertaking home care activities,

diagnostic services for patient or family TB suspects, and a secure supply of drugs.

In the infectious disease wards of general hospitals, and in other general and specialized health facilities which provide patient care, TB remains the most important opportunistic infection threatening HIV infected persons and AIDS patients. Protocols to reduce nosocomial infection risk, research into cost-effective physical or environmental modifications to reduce risk, and training for hospital/clinic staff in prevention of TB infection and its management are topic areas where research should continue on a regular basis.

D. Research. Operational research by WHO and others is needed to develop and test practices for coping with health service overloads created by TB and HIV/AIDS in both poor and middle income country settings. Priority topic areas include effective alternative supervision methods for TB chemotherapy (including use of single dose or combination drug forms), improved clinical diagnosis protocols for HIV-associated TB, and better, rapid TB programme evaluation techniques (such as smear conversion reporting and cohort analysis as recommended by WHO). In addition, the research can be usefully further done on the topics of cost-effectiveness of TB treatment in HIV-infected persons, preventive therapy, appropriate TB screening practices, education materials, and education messages and materials to encourage voluntary HIV testing and counselling in health workers.