the period 1980 to 1989."[5] There are two reasons for this reported increase. One is that the disease actually is increasing in frequency in this country; the second reason is that diagnostic procedures have improved over the decade and physicians are more likely to identify and report actual cases. However, between 50% and 90% of cases of hepatitis B are subclinical and never come to the attention of medical practitioners.

The Sub-Committee received disturbing testimony that hepatitis B may be seriously under-reported in Canada, the foregoing statements notwithstanding. Dr. Blendis made the following statements:

> "Everybody knows that the incidence rates (of hepatitis B) are hugely under-reported ... every time a laboratory ... makes a diagnosis of hepatitis .. they have to report it to the public health authorities. When the public health authorities receive the report, they send me a form to fill out about the details of the case. I estimate that I get only one form in ten of the patients who are diagnosed, and it may be even less." [6]

Dr. J.Z. Losos, Director General of Health and Welfare Canada's Laboratory Centre for Disease Control, agreed with the suggestion that hepatitis B is under-reported in Canada and stated that "under-reporting in any disease is a commonplace problem with public health".[7] Dr. Losos did not agree that there were ten times as many carriers of HBV as the incidence statistics show, but he did not offer an alternate figure.

VACCINATION AGAINST HEPATITIS B

Currently, there is no effective treatment for hepatitis B, except to treat the symptoms of the disease. As noted above, most patients recover from the infection after a period, and most adult patients eliminate the virus from their systems. Anti-viral drugs are not effective against hepatitis B. The principal weapon against this disease is vaccination to prevent the infection in the first place.

A vaccine against hepatitis B became available in 1982. This vaccine was derived from the blood plasma of humans infected by the virus. In 1987, new vaccines became available which were produced by yeast strains genetically modified to synthesize the viral surface antigen, designated as "HBsAg". Thus, these recombinant DNA (rDNA) vaccines do not contain any virus particles. Instead, they consist of a highly purified protein antigen. The vaccines, two of which are available in Canada, are known to be effective in conferring immunity in up to 95% of those persons who are vaccinated. [8]

An important issue to be considered in developing an immunization program for any disease is that of the costs and benefits of such a program. A basic objective is to identify and quantify the benefits to be obtained from an immunization program. Such benefits are both direct and indirect and may include a real decrease in disease incidence as more and more people are made immune to the infectious agent, and the possibility that the disease might be eradicated from the population, or nearly so. This could lead to significant reductions in present and future health-care expenses, and lower economic impacts of the disease in terms of employee absenteeism and premature deaths of affected persons, including wage-earners. The reduction in human suffering from the disease obviously is a major consideration although the dollar value cannot be calculated.

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5 Health and Welfare Canada, "National Advisory Committee (NACI) Statement on Universal Immunization Against Hepatitis B", *Canada Diseases Weekly Report,* 3 August 1991, p. 170.

6 *Proceedings,* Issue 2, p. 8.

7 *Proceedings,* Issue 1, p. 37.

8 *Proceedings,* Issue 2, p. 15.