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COMPULSORY OR VOLUNTARY VACCINATION

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COMPULSORY OR VOLUNTARY VACCINATION

Importance of the question

Periodically there are reports in the press of bitter controversies between the advocates of compulsory vaccination and its opponents. These conflicts have their influence on public opinion. For that reason the health authorities and the legislatures are faced from time to time with the question of whether or not to keep compulsory vaccination in force or of whether it would be advisable to introduce new compulsory immunizations. This difficult aspect of the vaccination problem will also be considered during the Technical Discussions of the World Health Assembly in 1960. Indeed one of the items on the agenda for these discussions, which will have as their main theme "The Role of Immunization in Communicable Disease Control", is "Voluntary versus Compulsory Vaccination".

The dilemma facing the health authorities or the legislature as to whether to maintain or to abolish compulsory vaccination is particularly difficult to resolve in countries where improvements in sanitation and the practice of vaccination have led to the almost complete disappearance of diseases such as diphtheria and smallpox. As emphasized by Brockington (1954) it is not easy under such conditions to persuade the public that the existing legislation should be maintained or even simply to persuade parents, quite apart from compulsory vaccination, to have their children immunized.

The importance of certain types of immunization, particularly against diphtheria and smallpox, has been emphasized on numerous occasions. Thus in speaking of smallpox vaccination F. F. Russell stated in 1929 "To maintain a constant level of immunity against smallpox in such a population, vaccination must be done regularly on all newcomers, if possible in the first year of life; and re-vaccination must be carried out on all schoolchildren. To this activity there should never be an end until the whole world is vaccinated, and smallpox completely eradicated; so long as this disease lurks in some backward region, it may reappear in epidemic form unless all civilized countries continue to vaccinate each new generation." This forecast made thirty years ago, has been

confirmed by the experience of the last ten years. Furthermore, in respect of anti-diphtheria immunization it was recently stated that the disappearance of that disease as a result of immunization should be considered as "...[1] one of the greatest triumphs of medicine in the past 1000 years." (Paul 1954).

However, in contrast to these statements in favour of immunization against diphtheria and smallpox, the public is also subjected to anti-vaccination propaganda either from associations formed to combat compulsory vaccination or vaccination altogether or, sometimes, from physicians. Thus with regard to BCG vaccination, Melnotte (1956) states that once such physician did not hesitate to draw an analogy between the "20 families of vaccine merchants and the 200 families of the merchants of death", while another, in speaking of anti-smallpox vaccination, said "It may be wondered today whether one of the reasons for the increase in tuberculosis is not the general use of Jennerian vaccination". Such grotesque statements are by no means rare. No doubt, like certain statements of the anti-vaccination leagues, they probably have little effect on the informed public and are more a matter for the psychiatrist than for the hygienist, as Hénon said in 1952.

However, some of the arguments against compulsory vaccination, or against vaccination altogether, seem more convincing. They are based upon apparently objective statistics concerning the ineffectiveness of vaccination or its dangers, on respect for the liberties of the subject, on the disappearance of the disease, etc. These arguments have a more marked influence on public opinion and the legislative authorities.

Two trends, therefore, can be discerned at the moment: on the one hand, statements that the maintenance of compulsory vaccination is necessary and on the other a fiercely hostile attitude among certain sections of the public.

It is understandable, therefore, that it can be very difficult for the health authorities to adopt a position on this matter. It is all the more so in that to protect the community effectively from diphtheria and smallpox it is known that a sizeable proportion of the population - 70 per cent. or even more - must be immunized. Furthermore, it is essential that the immunity thus obtained

should be consolidated by means of booster doses or re-vaccination. Now, to cover such a large proportion of the population there is no other solution but compulsory vaccination and/or persuasion through an expensive campaign of health education.

The purpose of this study is to review the arguments advanced in favour of voluntary and compulsory vaccination respectively. It will begin by summarizing the facts, i.e. the legislation on immunization against diphtheria and smallpox throughout the world. Other questions will then be dealt with, i.e. the relationship between compulsory vaccination, the number of vaccinations and the existence of smallpox and diphtheria, the arguments in favour of compulsory vaccination, some of the legal and constitutional aspects of compulsory vaccination, post-vaccinal complications and legal responsibility, the attitude of the public towards vaccination, and the importance of health education, whether there is compulsory vaccination or not.

The facts

Two reviews of comparative health legislation in regard to immunization have been published in the International Digest of Health Legislation. The first (1954) dealt with vaccination against smallpox, the second (1957) with immunization against diphtheria. The study of smallpox vaccination reviews legislation in 50 or so countries. Since the study was published in 1954, ten or a dozen countries have either modified their legislation or introduced new legislation on this subject. At the present moment, therefore, precise information is available concerning the legislation in 60 or so countries on Jennerian vaccination. In general it can be concluded that in the majority of countries and territories the attitude towards smallpox vaccination is the same. With few exceptions it is compulsory. However, there are important differences in the regulations, particularly in respect of the age of primary vaccination, whether re-vaccination is compulsory or not, compulsory vaccination for certain groups of the population, provisions concerning emergency vaccination in cases of epidemic, compulsory vaccination as a condition for school entry and exemptions from vaccination. Most of the regulations make

vaccination compulsory before the age of one year. In some countries, however, late primary vaccination is possible since it can be imposed as a condition for school entry (in some of the States in the United States of America, for example); in most of the European countries, vaccination must be carried out during the first year of life and at the latest before the child has reached the age of two. Exceptions to this rule are Denmark, where a child must be vaccinated before the age of seven, or in any case before starting school, and Sweden, where vaccination must take place at the latest during the year in which the child reaches the age of four (1958). Re-vaccination is compulsory in the majority of countries and in most cases must be carried out before the age of ten. Some countries require further re-vaccinations at more or less long intervals. Emergency vaccination, e.g. during an epidemic or under the threat of an epidemic, may be imposed by the health authorities in several countries. In these cases also, late primary vaccination, with the risks which it involves, can then be carried out.

Exemptions from vaccination may be classified under two headings: the first, conscientious objections, and the second, exemptions for medical reasons. A conscience clause was introduced in 1898 in British legislation.[1] In 1907 amendments to the Act made the procedure for opposing vaccination in this way easier. A conscience clause was also included in the legislation of the Netherlands before the Act was amended in 1939. There is still such a clause in Sweden and Ireland and in some Commonwealth countries (the Union of South Africa and Rhodesia, for example). In Finland, vaccination is voluntary. Some sections of the population must, however, undergo vaccination: officials in certain branches of the administration, medical students, future midwives and nurses. This compulsion applied to certain population groups could also lead to late primary vaccination. Provisions are made for exemptions on the basis of medical contra-indications in most national laws and this makes it possible for a certain number of people to escape compulsory vaccination. In general,

[1] In July 1948 compulsory vaccination was abolished in Britain (see page 8).

however, these provisions have the effect of deferring vaccination, since the legal obligation remains in force until the age-limit fixed by the law concerned. Medical contra-indications in most cases comprise skin or nervous diseases or constitutional defects or the fact that the patient is suffering from a communicable disease at the time when vaccination is being carried out.

It was in the Canton of Geneva in 1932 that immunization against diphtheria was first made compulsory. Some countries, such as France, Hungary, Italy, etc., followed suit before 1940. In 1941, furthermore, an intensive campaign was launched in the United Kingdom in favour of immunization against diphtheria. Since 1940 several countries have introduced compulsory diphtheria immunization and it is now obligatory in almost 30 countries. As for the texts of the regulations themselves, the same comments apply as for smallpox vaccination. The regulations differ in respect of the age at which immunization is compulsory, the obligation to undergo one or more booster doses, immunizations in an emergency, etc. The first injection of toxoid must generally be given between the ages of six months and two years. Sometimes immunization is made a compulsory condition for school entry, or compulsory for all schoolchildren. The booster doses which are essential if immunity is to be consolidated are not compulsory in several countries. In contrast, other countries make booster doses compulsory or require vaccination in emergencies. It is in the case of immunization against diphtheria that the problem of combined vaccinations arises. It may be said that even where the law does not make it compulsory, as is the case in several countries, combined vaccinations are current practice. There are striking differences of opinion, however, with regard to the immunization schedule to be followed.

To sum up, vaccination against smallpox is compulsory in most countries in the world and immunization against diphtheria in some 30 countries. The texts of the regulations make provision, however, for exemptions from legal compulsion, mainly on the grounds of medical contra-indications, thus considerably reducing their coercive effect. In regard to vaccination against smallpox, the inclusion of a conscience clause in several instances, combined with the granting of exemptions on medical grounds, curtails the scope of certain regulations.

THE RELATIONSHIP BETWEEN COMPULSORY VACCINATION, THE NUMBER OF PERSONS VACCINATED AND THE INCIDENCE OF SMALLPOX AND DIPHTHERIA

Attempts have been made to determine the relationship between compulsory vaccination, the number of persons vaccinated and the number of cases of smallpox or diphtheria. When these relationships are studied, it becomes obvious that only two matters are pertinent: firstly, the relationship between legal compulsion to undergo immunization and the number of persons actually immunized, and secondly, the relationship between the number of persons in fact adequately immunized and the incidence of smallpox or diphtheria.

Unfortunately trustworthy information on these two counts is scanty. In the case of diphtheria, for example, morbidity statistics depend on reporting by physicians and only approximate figures are available concerning the number of immunizations carried out. In a recent study published in the Epidemiological and Vital Statistics Report (1958) the astonishing fact is reported that the number of cases of diphtheria in countries apparently well immunized is very considerably greater than the number of cases in Denmark or the United Kingdom, for example, where diphtheria has practically disappeared, although, according to statistics received, the figures for the actual number of immunizations carried out are proportionately lower in those two countries than those declared in other countries.

In assessing the relationship between compulsory vaccination and the number of individuals vaccinated, it is interesting to see what happens in countries where compulsory vaccination against smallpox has been abandoned or introduced. As is known, in the United Kingdom vaccination ceased to be compulsory in 1948, while in Switzerland, also in 1948, a Federal Decree abolished compulsory vaccination and only a few cantons have since decided to keep it in force. In the Netherlands, the law was amended in 1939 and has been particularly flexible since then. In Austria, on the other hand, where vaccination had been voluntary, it has been obligatory since 1948.

Smallpox vaccination was, in principle, compulsory in the United Kingdom from 1853 onwards. In 1897 and 1907 the inclusion of a conscientious objection clause resulted in a progressive diminution in the number of vaccinations. During the years 1940 to 1949, in which several countries had intensified vaccination, the average annual figure did not exceed 35 per cent. for children aged under one year. The abolition of compulsion in July 1948 was followed by a sharp decline in vaccination in the youngest age-group. The figure, in fact, did not exceed 20 per cent. among children of that age. Since 1951, however, the figures have been slowly rising and now amount to about 40 per cent.[1] A Ministry of Health report, however, states that in 1952 only one child out of every twenty-five which had received an early primary vaccination was re-vaccinated. It is not astonishing in these circumstances, as Parish comments (1956), that it has been reported that the general level of immunity of the population has fallen to an alarming degree.

In Switzerland, a circular of the Service féderal de l'Hygiène publique, published in the Veska-Zeitschrift (1953), stated that in cantons where compulsory vaccination had been abolished, the number of primary vaccinations had fallen very sharply and amounted to barely a few hundreds even in the most populous cantons. In the Netherlands since 1939 the vaccination law contains particularly flexible regulations. The text is so worded that the health authorities despite the absence of any direct compulsion, may hope to obtain a high percentage of vaccinations. Before 1939 vaccination was indirectly compulsory, particularly as a condition for admission to school. The law, however, made provisions for conscientious objection. The Act of 22 December 1939 provides simply that before a child reaches the age of one year its parents must produce a certificate certifying that it has been vaccinated or

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[1] The vaccination "acceptance rate" for primary vaccinations of children under the age of one year was 38.4 per cent. in 1956, 43 per cent. in 1957 and 44.5 per cent. in 1958 for the whole of England and Wales.

merely indicating the reasons why vaccination has not been carried out. If the reasons are medical in nature and are set forth in a medical certificate, the parents are not troubled further. If no medical certificate is given, the parents are summoned before the Bourgmestre to discuss their statement of non-vaccination. The 1939 Act, while encouraging parents indirectly to have their children vaccinated, leaves the door wide open to exemptions, since all direct compulsion has disappeared. Before 1939, particularly because of the high number of cases of post-vaccinal encephalitis, smallpox vaccination only covered a relatively small percentage of children. Since 1939 the percentage of children vaccinated has gradually increased and in 1949 reached about 73 per cent. of children under the age of two. This level has been more or less maintained since then.

Since the introduction of compulsory vaccination in Austria, Puntigam (1956) notes that the result has been to increase very sharply the number of persons vaccinated. He remarks that when there was no compulsion vaccination was only practised in Austria at times when the number of cases of smallpox increased noticeably. The same applies, however, to immunization against other communicable diseases. Furthermore, particular caution must be shown in interpreting statistical data concerning the number of vaccinations, for, in the case of smallpox for example, they undergo considerable variations when there is an outbreak of the disease.

Some investigations have been undertaken to demonstrate the relationship between compulsory vaccination and the number of cases of smallpox. The essential factor in this relationship is not known, i.e. the number of persons effectively immunized. Hanlon (1955) published a study showing that in the United States of America, where the local situation with regard to legislation on vaccination is comparable with that in Switzerland, 15 States and territories make it compulsory and 22 States leave the decision to the local authorities or make it compulsory in cases of epidemic or threats of epidemic. Between 1936 and 1945 in States where vaccination is obligatory, there were many fewer cases of smallpox. Stiner (1924) has published an important study on the Swiss

epidemic of alastrim in 1921-1923. This study shows that 15 cases only were reported in cantons where vaccination was compulsory, as against some 3900 cases in other cantons. These two studies give some idea of the extreme variety of systems in countries where regional authorities are responsible for the measures to be taken.

It should be noted that a law enforcing immunization against diphtheria or smallpox is useless if re-vaccination or booster doses are not compulsory. The resultant danger for adults, particularly in the case of diphtheria, has been pointed out by Paul (1952) and Paschlau (1950). Furthermore, since immunity against smallpox is temporary, a primary vaccination not followed by re-vaccination gives a false impression of security. It should be noted, however, in this connexion that even primary vaccination alone, if it covers a considerable percentage of children in non-endemic regions, is nevertheless of obvious importance. Indeed, in cases of epidemic or threat of epidemic those who have undergone primary vaccination run a smaller risk of post-vaccinal complications, if it is decided to carry out emergency vaccination of population groups.

Laws on compulsory vaccination often remain a dead letter or are applied in such a haphazard manner that McVail (191-) remarked on this subject: "The object of vaccinal legislation is, of course, to promote vaccination. If it has no such effect then it is useless and ought to be given up." In this case it is doubtless preferable to achieve vaccination through persuasion and propaganda.

It seems, therefore, that in countries which have introduced compulsory vaccination, the vaccination rate is higher than in other countries. In regard to a possible connexion between the existence of a legal obligation to undergo vaccination and the incidence of smallpox or diphtheria, there is little information available. Furthermore, the conclusions that could be drawn from what there is depend solely on the rate of effective vaccination.

ARGUMENTS FOR COMPULSORY VACCINATION

Several arguments have been put forward for making immunization against both smallpox and diphtheria compulsory. It becomes necessary to make vaccination compulsory, for example, when health propaganda and education fail to have any effect, or in order to counter the antisocial attitude of certain elements in the population, who, misusing their right to liberty, systematically oppose vaccination, or to combat the apathy of the public because education and propaganda are too expensive, because it is the only way of obtaining a high enough rate of vaccination and, finally, because apart from health education, other factors must also be considered. Indeed, if a prophylactic agent is effective and sure, there is every justification for believing "that a citizen who does not have himself vaccinated is committing an offence not only against himself or the health of his own children but perhaps also against the well-being and health of the other citizens and the community as a whole". (Cvjetanovic et al., 1959).

In 1939 Abbadie found that in Argentina, health education in favour of vaccination had had little effect, despite the great efforts made to achieve adequate collective prophylaxis. He considered that legal action to make vaccination obligatory was needed, particularly since this type of immunization is not dangerous (diphtheria).

Another argument is advanced: public apathy towards vaccination campaigns: "As a people we are too apathetic about health, and if immunization of the community is to be left entirely to individual local authorities a great amount and variety of propaganda will have to be used at considerable expense to cajole parents to have their children immunized. There is increasing evidence from schools and other sources that many parents are willing and eager to see their children protected against the dreaded diphtheria, but only coercion will move others." (Lancet, 1940).

With reference to the misuse of the concept of freedom it has been also stated: "Progress has been impeded by many factors, and not least by that 'doltish prejudice', not confined to any one social or intellectual stratum, which is fostered by anti-social societies posing as the protagonists of liberty. When liberty becomes anti-social and impedes the application of scientific truth to the improvement of human well-being then some form of compulsion is the only remedy." (Ledingham, 1939). And in this connexion it has been emphasized that there can be no result for the community in the case of diphtheria prophylaxis if the majority of the members of the community are not immunized; if this is not so the vaccination programme is defeated (Lancet, 1940).

It was also the high percentage of immunizations against diphtheria needed if an immunization programme is to be successful which led Melnotte (1956) to declare: "to abolish legal compulsion means, in fact, to suppress collective immunization and yet it is known that if it is to be effective any immunization must cover at least 70 per cent. of the susceptible population."

Another author (Corre-Hurst, 1959) relies on the facts themselves to demonstrate that there can be no argument concerning the need for compulsory immunization since there can be no possible comparison between the present epidemiology of certain infectious diseases and the frightful picture of the great epidemic scourges of days gone by. He stated:

> "When I was a non-resident student at the Claude-Bernard, a whole ward was given over to diphtheria. It was the busiest ward. Every morning eight to ten persons were admitted to hospital with diphtheria, often of the malignant kind.
>
> When I was head of clinic at the same hospital and when immunization against diphtheria was compulsory and already almost general, it would happen that during a student's whole training period nobody with diphtheria would enter the hospital and that it would thus be impossible to provide the students with a case of diphtheria to examine.

Soon, thanks to immunization, this terrible disease will be no more than a bad memory.

To conclude, what is needed is a guarantee that compulsory immunizations will be maintained. They have become everyday practice."

Paschlau (1950) emphasized another aspect of immunization against diphtheria in support of the introduction of compulsory inoculation against the disease. He found that when immunization is voluntary, it is carried out haphazardly, booster doses being often neglected. This results in an increase in the incidence of the disease among adults. He concluded that all children of appropriate age should be immunized and that children of all ages should be immunized or given booster doses. To attain this object the only solution is to enforce immunization against diphtheria in the same way as against smallpox.

Other authors, however, such as Anderson & Arnstein (1953) point out that while in the United States of America there is no constitutional objection to immunization against diseases other than smallpox - compulsion has in fact been introduced in certain States - the health authorities consider that "the element of compulsion should be used as sparingly as possible and should be reserved for those situations that are of major potential danger and controllable through no other procedures". (page 92).

Indeed, although before the introduction of treatment with toxoid, diphtheria was responsible for the deaths of whole groups of children, it cannot be considered like smallpox as a public calamity for there is no specific treatment for smallpox, while there is one for diphtheria. Furthermore, immunity against diphtheria is built up gradually as a result of repeated latent infections, but this is not the case with smallpox. These authors conclude that "we may logically hesitate to extend the principle of compulsory immunization unless experience shows no other way of combating a potentially serious situation". (page 93).

This argument for immunization being voluntary on the grounds that specific treatment for the disease exists is not accepted by Cruickshank (1952), who

states that it was hoped at one time to control diphtheria by means of specific anti-toxin but that despite all the efforts made and improvements in therapy, in addition to early diagnosis, it had not been possible to prevent a high morbidity rate from the disease before 1940. In 1938 there were 65 000 cases, with 3000 deaths (United Kingdom). It is preventive immunization which has led to the practical elimination of diphtheria.

Anderson & Arnstein (1953; p. 92) are, however, in favour of compulsory vaccination against smallpox. In fact experience has shown it to be necessary for the control of the disease. An act making vaccination compulsory is of assistance because it can protect a sufficiently large proportion of the public and thus prevent spread of the disease. Above all, however, it serves to proteet those who otherwise, through ignorance or oversight, would not be vaccinated. The educated sections of the population do not need compulsion for this purpose.

According to the authors quoted, compulsory vaccination should therefore be kept in force for various reasons: to combat the anti-social attitude of certain population groups, to overcome the apathy of other groups, to mitigate the lack of success of propaganda efforts and to obtain a level of immunization high enough to eradicate the disease from the community.

LEGAL AND CONSTITUTIONAL ASPECTS OF COMPULSORY IMMUNIZATION

The opponents of compulsory immunization appeal in most cases to the right of personal freedom which various constitutions have proclaimed among the rights of the citizen. Others invoke religious freedom, and certain religious sects see in compulsory immunization an obstacle to the normal exercise of that freedom.

It must be pointed out that in addition to compulsory immunization health legislation contains numerous provisions which restrict the exercise of personal rights: the obligatory isolation of dangerously infective tuberculosis patients, the compulsory treatment of anti-social venereal diseases patients,

the measures of isolation provided for in quarantine laws, obligatory school medical examinations, the compulsory consumption of iodized salt or fluoridized drinking water, compulsory disinsectization of dwellings, etc.

The argument most generally used in favour of compulsory vaccination is its necessity in the interests of the community. Savatier (1956), for example, considers that "a certain minimum distribution of vaccination is necessary to obtain good epidemiological results and even to provide individual protection in view of the possible margin of variation in the duration of vaccinal immunity in different individuals. It must not be forgotten that even on an individual basis everyone is as much, if not more, protected by vaccination of other people than by his own vaccination". It is thought in Germany that compulsory vaccination could be an infringement of the principles of the integrity of the person if this compulsion infringes those principles more than the necessity of vaccination requires. So far as compulsion with regard to smallpox vaccination is concerned, the author considers that the dangerousness of smallpox and the effectiveness of vaccination are such that the principle of integrity of the person has no bearing but that this is not the case in regard to obligatory immunization against other diseases (Spiess, 1958).

In the United States of America several judgements, both in appeal courts and in the Supreme Court itself, have indicated that the obligation to undergo vaccination is not an infringement of the liberty of the subject guaranteed by the Constitution, since that liberty in no way implies the right of a citizen to throw off all restraint at any moment and in any circumstances; otherwise the very existence of society would be endangered. The public interest requires that each citizen should submit to vaccination and entails possible sanctions in cases of unjustified refusal. Such sanctions may, for example, go as far as exclusion from school. However, despite this fact, vaccination must not be carried out by force.

Furthermore, several court judgements show that in the United States the argument of religious freedom is not accepted as a reason for exemption from obligations arising from health legislation and from vaccination in particular.

Thus, in regard to the compulsory isolation of patients suffering from communicable disease, the Supreme Court of the State of Florida declared:

"Religious freedom cannot be used as a cloak for any person with contagious or infectious disease to spread such disease because of his religion." (Tobey, 1954).

At the Fourth International Congress of Roman Catholic Physicians it was concluded that "despite the fact that compulsory immunizations are an obstacle to human freedom, the principle of compulsion is legitimate; indeed, the fact that the person who refuses to be vaccinated may constitute a danger for other people is sufficient to justify the compulsory nature of immunization". (Grenet, 1950).

It does not seem therefore that there are valid constitutional or religious reasons for rejecting the principle of compulsory immunization. Furthermore, in most countries the legislative authorities have attached penalties to failure to undergo compulsory vaccination.

POST-VACCINAL COMPLICATIONS AND RESPONSIBILITY FOR THEM

Among the arguments which have been used against compulsory vaccination is the fact that complications occur which are attributable to vaccination. Of course, in children complications caused by immunization against diphtheria are rare. It has been noted, however, that immunization against diphtheria or whooping cough could be considered responsible for infection with poliomyelitis in a certain number of cases. Furthermore, the complications of anti-smallpox vaccination, particularly post-vaccinal encephalomyelitis and generalized vaccinia, are formidable. The frequency of cases of post-vaccinal encephalitis varies to an extraordinary degree from one country to another. Figures have been reported ranging from one case out of 3000 vaccinations to a total absence of complications in several million vaccinations, as occurred in a certain number of American countries (<u>Chronicle of the World Health Organization</u>, 1959). In 1947 during an outbreak of serious smallpox in New York more than six million vaccinations were carried out. Forty or so

probable cases of encephalitis were subsequently reported. Post-mortems on eight cases in which death had been attributed to encephalitis showed, however, that the diagnosis had been wrong (Weinstein, 1947). In the case of emergency vaccinations, the risk of complications is considerably greater since a large number of persons are vaccinated without any distinction. The health authorities could obviously restrict vaccination to contacts but unfortunately the public sometimes demands vaccination on its own account and it is not always possible to refuse it.

In regard to post-vaccinal complications it has been said: "However regrettable these complications are, they should not be allowed in any way to jeopardize the measures decreed by the legislature; the efficiency of those measures requires no further proof." (Pestel, 1955).

The reports of post-vaccinal encephalitis from several countries after 1920 led to a reduction in the vaccination rate in several countries. It also led to amendments to the law and in particular to the requirement that primary vaccination should be carried out at an early age. That was the case, for example, in the Netherlands.

The compulsory nature of vaccination and the complications which it may bring in its wake raise the question of responsibility and compensation for injuries received. This problem arises in a double form. In cases where the vaccinator's technique has been at fault, it is in theory the vaccinator who is responsible for the accidents which may occur. If no fault can be attributed to him it is theoretically the State (which makes vaccination compulsory) which should compensate for any damage which may be caused by the vaccination.

In France a decision by the Tribunal administratif of Bordeaux (1956) concluded in this case that the public authorities were responsible. In Germany (Hesse) the Act of 6 October 1958 on injury caused by vaccinations when made compulsory by the health authorities provides for compensation under certain definite conditions. If these conditions are fulfilled, compensation can cover

the expense of treatment, the granting of a pension for any invalidity that occurs and, if necessary, the expenditure involved in training with a view to professional rehabilitation.

THE ATTITUDE OF THE PUBLIC TOWARDS VACCINATION

There have been few studies on the attitude or reactions of the public towards compulsory vaccination or the introduction of new methods of immunization. It is, however, important to get to know the reactions of the public. Indeed, in most countries, the attitude of the authorities and the introduction of new legislation are influenced, inter alia, by public opinion. It is therefore necessary to make surveys among the public to find out the reasons in favour of or against the acceptance of vaccination.

In the United States of America, a survey was recently made on public reactions to vaccination against poliomyelitis. A few months after the beginning of the campaign for vaccination, 43 million persons had been vaccinated. It was thought that this figure was inadequate and that it ought to reach 85 per cent. of the susceptible population. This vast inquiry was undertaken with a view to studying the causes for the resistance of part of the population to vaccination and to find out which members of the community or social circle played a determinant role in the decision to undergo vaccination. This study was to serve as a basis for the policy to be followed in encouraging the public to get vaccinated. The inquiry was undertaken by the American Institute of Public Opinion (D. R. Gallup) and the Bureau of Applied Social Science Research. In California it was conducted by the Department of Health and the United States Bureau of the Census, (Glasser, 1958).

According to the inquiry it was first of all discovered that the public was well informed regarding vaccination and that in most cases it was not opposed to it. The decisive factor which induces a person to request vaccination was absent, however, in various members of the community. Among adults one of the important reasons quoted for not having submitted to

vaccination was procrastination and the idea that the disease could not attack them. This attitude of "putting off till tomorrow" was found also among parents, as well as the belief that children of a certain age were less susceptible to the disease. In general, a relationship was found between intellectual level, income and the acceptance of vaccination. A great majority of adults asserted that they would certainly have been vaccinated if their doctor had advised it. Among those who had not been vaccinated were found, however, in most cases, persons who rarely consulted a doctor. The role of the paediatrician in particular appeared to be decisive. This inquiry showed further the overwhelming influence which a doctor may exert during a vaccination campaign (Glasser, 1958).

In California (Merrill et al., 1958) the inquiry was made of mothers who had not had their children vaccinated; some of these were opposed or apathetic towards vaccination and others favourable to it, despite the fact that their own children had not been vaccinated. In this latter group the reasons put forward were either oversight or a fear of vaccination or the complications that it might involve. Those who were indifferent or opposed to vaccination were found to belong for the most part to an economically lower social level. Their behaviour was influenced by members of their own social milieu, as was the case among those who had had their children vaccinated. It was found also that their children had not been vaccinated against other diseases either. What was interesting to note was that it was generally the mothers who were aware of the accidents which had occurred during vaccination (1956) who were, in spite of everything, more favourable to it than those who were not aware of the accidents.

The importance of the purposes of this inquiry is obvious and similar inquiries should be undertaken in other countries with regard to various measures of immunization, whether compulsory or not.

THE IMPORTANCE OF HEALTH EDUCATION

Whether or not vaccination is compulsory, health education is indispensable: "The ideal would be to lead the public to a complete understanding of the reasons for immunization, even when it is compulsory, and to induce it to co-operate of its own free will. Here health education has a predominant role to fulfil. There is no doubt that compulsory immunization does not reduce the need for and importance of well-organized and carefully planned health education, even though there is sometimes a tendency to underestimate its role when a mass compulsory immunization campaign is undertaken. Health education should be considered as an integral part of every mass immunization campaign." (Cvjetanovic et al., 1959)

Legal provisions alone are rarely sufficient even in countries where the law is rigorously applied. In fact, something more than mere legal coercion is needed. The proof is that in the United Kingdom, where there is no legislation on diphtheria immunization, since 1940 a very large number of children has been immunized without any compulsion. Persuasion therefore is a more powerful weapon than legal regulations. Even if regulations are considered necessary, the aim in view, i.e. the obtaining of as high a rate of immunization as possible, will not be attained if at the same time there is failure to persuade the population of the usefulness of vaccination. Health education is all the more necessary in the countries where the disease has practically disappeared as the result of vaccination, for it is then difficult to convince the public, even its educated members.

The problem of health education is connected with the attitude to be taken towards the adversaries of vaccination. Anderson & Arnstein (1953; p. 309) stated in this connexion:

> "However much one may differ with the ideas of such groups, one must respect their sincerity of purpose as long as the information they publish is correct and not deliberately misleading. Unfortunately this is not always so. In general, however, it reflects a very superficial

understanding, as evidenced by the free interchange that they make in their use of such terms as "anti-toxin", "toxin", "toxoid", "serum", and "vaccine". Such misinformation serves only to mislead the public. The anti-vaccination groups are usually animated with a crusading zeal that could accomplish much good if directed toward a worthy cause. While they influence a small number of persons and may therefore embarrass a public health program, their total influence is usually not large,"

. . ."Nothing is accomplished by public controversy with them. Far greater good comes from quiet and dignified public and personal education."

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