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# **Vaccines & Vaccination**

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#### Particulate systems-mediated DNA vaccines

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Vaccines are expected to give lifetime protection from infectious diseases, ideally with a single immunization. An ideal vaccine should have the characteristics such as long-term immunity and efficacy with single dose and easy administration, simple manufacturing properties, resistance to temperature changes and multivalency. DNA based vaccines are among the latest developments in vaccine technology and consist of DNA plasmids containing the genetic sequence encoding desired antigens with the supporting transcriptional elements that ultimately allow efficient protein production. The advantages of DNA vaccines over conventional vaccines are the higher stability of pDNA, lower costs, decreasing the risks of infections due to weakened viral vaccines, ability to increase the multi-target antigen capacity on the plasmid and to generate humoral and cellular immune response. It has been observed in the study carried out that therapeutic immune responses are generated in many animal models as a result of the injection of the antigen coding DNA to the interior of the muscle. However, pDNA has low effectiveness due to the breakdown *via* enzymes after being administered to the muscle. That is why systems are needed that can protect the DNA from the effects of enzymes. In general, cationic and especially polymeric and lipidic transport systems have been used as DNA carrying systems for different administration routes such as oral, intramuscular, subcutaneous, vaginal and nasal. When compared with the breakdown of DNA as a result of the enzymes in the bodily fluids, it has been observed that the DNA encapsulated in particulate systems are better preserved than adsorbed naked DNA.

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## Study of coverage and determinants of vaccination in children aged 1 to 3 years in a rural population of Delhi

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**Background:** Since the launch of Expanded Program on Immunization in India in 1985, the country has made tremendous progress in terms of coverage and so has the national capital, New Delhi.

**Methodology:** The present study assess the immunization coverage, determinants, knowledge, attitude and practices (KAP) of respondents and proportion of Fully Vaccinated For Age (FVFA) children i.e., those receiving timely immunization (within one month of due date) and determinants of the same. A universal sample consisting of all children between 1 and 3 years was taken and information regarding status and KAP of respondents was obtained by house to house survey.

**Findings:** Out of the 235 children that were included in the study, 86.6% males and 77.9% females were fully immunized. The immunization coverage of the various vaccines was 97% for BCG, 93.3% for OPV-1, DPT-1, OPV-2 & DPT-2, 89.6% for OPV-3 & DPT-3 and 86.7% for measles. The knowledge about vaccines was rather poor. The determinants of immunization status were availability of immunization card, tetanus immunization of mother, place of immunization, religion, parent's education, birth order and type of family.

**Discussion:** The study shed light on the coverage and various determinants of immunization. Also, it is a unique study that has taken up the issue of timely immunization and no other study has been conducted in the country on this issue.

**Conclusion:** Immunization coverage of a rural population was found to be better than the rest of Delhi as stated by survey NFHS-3 (National Family Health Survey).

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