Human measles virus and canine distemper virus are closely related. So close that dogs given human measles vaccine obtain some protection against canine distemper (ref)

Some children are born with a reduced ability to produce antibodies. They are called agammaglobulinemic children. They can still be given measles vaccine and become protected:

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“Agammaglobulinemic children [those that can not produce sufficient antibodies] do not have increased susceptibility to the common viral diseases and exanthems of childhood. They usually overcome measles, mumps, varicella, and rubella in an ordinary fashion.”

However, when children also lack the cells for immunological memory, a Measles infection, even from the vaccine, can be fatal:

“Other dangerous viruses for patients with SCID are the cold sore virus (Herpes simplex), adenovirus, parainfluenza 3, Epstein-Barr virus (EBV, the infectious mononucleosis virus), polioviruses, measles virus (rubeola) and rotavirus. Since vaccines for chicken pox, measles, mumps, rubella and rotavirus are live virus vaccines, children with SCID can contract infections from those vaccine viruses if they receive these immunizations.

This indicates to me that in dogs that have been vaccinated against canine distemper, it is probably not their antibody titer but rather the number of their dedicated memory T cells that are most important.