

# Screening of maternal Toxoplasmosis in Pregnancy: Laboratory Diagnostics in the view of Public Health Requirements

**Problem:** Serological screening for maternal *Toxoplasma* infections in pregnancy has been questioned recently. Studies from countries with established screening programmes have not yielded convincing results on the question of effectiveness due to poor data quality.

**Methods:** We analyze some diagnostic difficulties for routine laboratories, poor public health guidance of existing screening programmes, and their mutual worsening impact on the efficacy of the programmes and on toxoplasmosis research.

**Results from the laboratories' perspective:** False positive screening tests may be more likely than true maternal *Toxoplasma* infections and diagnosis often depends on confirmatory testing in experienced reference laboratories. Apart from clear seroconversions, any marker to assign the time point of infection to the ongoing pregnancy (IgM, avidity, etc.) suffers from important limitations. With poor screening compliance, many screening alerts come from first serum samples in pregnancy that are cumbersome to test while seroconversions are seldom observed due to missing follow-up samples in late pregnancy.

**Results from a public health perspective:** inadequate epidemiological assessment and research, insufficient quality control for compliance, and little consideration of diagnostic peculiarities for the design of more effective preventive programs has resulted in poor performance. These shortcomings have contributed to the present doubts about preventive *Toxoplasma* screening in pregnancy.

**Conclusion:** We recommend that a team of public health decision makers, epidemiologists, and experts from toxoplasmosis reference laboratories reevaluates the existing activities in a given country to build up a well-designed preventive program that avoids these drawbacks.

## Recommendations for public health decision makers

- Implement a central epidemiological unit
  - To inform about seroprevalence and maternal infections
  - To inform about prenatal infections in the offspring
  - To inform about treatment and long-term outcome of prenatal infections
  - To control compliance with the screening schedule
- Introduce mandatory reporting of all relevant data to the epidemiological unit
- Implement a single reference laboratory
- Nominate screening laboratories
  - Being able to provide appropriate electronic data records
  - Equipped with appropriate tests
  - Quality controlled by the national reference laboratory
  - Equipped with electronic reminder system
  - Equipped with facilities to store frozen sera for a minimum of 12 month
- Include birth clinics (test at delivery!) to the screening programme
- Keep close contact to prenatal care doctors and their representatives to foster adherence to the national screening scheme
- Decide on shortest possible, feasible and affordable screening intervals

## An example from Austria (province of Upper Austria, 2000 - 2007)

Screening data from more than 60,000 pregnant women have been analyzed. Despite the fact, that three checks (one per trimester) were scheduled, less than 30 % of these women had their three checks completed. The incidence of *Toxoplasma* infections had to be estimated from two regression models that yielded different results (0.17 % or 0.5 %, respectively) with broad confidence intervals. Due to strict data protection legislation in Austria, the investigators had no access to results from two reference laboratories and therefore no information about transmissions to the fetus.

Sagel U, Krämer A, Mikolajczyk RT (2011) Incidence of maternal *Toxoplasma* infections in pregnancy in Upper Austria, 2000 – 2007  
 BMC Infect Dis 2011;11:348  
 online available: <http://www.biomedcentral.com/1471-2334/11/348>

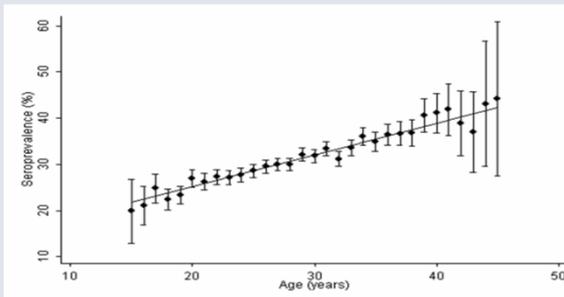


Fig. 1. Age dependency of seroprevalence of *Toxoplasma* infections in pregnancy.  
 (from Sagel U et al. 2011)

## References

Sagel U, Krämer A (2013) Screening of Maternal Toxoplasmosis in Pregnancy: Laboratory Diagnostics from the Perspective of Public Health Requirements.

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