

Supplementary Materials:**Table 1 with References. Diverse pathogens are capable of transplacental infection.**

Here we list the major pathogens capable of transplacental infection. Several more—e.g. Epstein-Barr Virus [1], Hepatitis B virus [2], HIV [3] and HSV [1]—rarely cross the placenta, more are transmitted perinatally. Others have been raised in case reports and animal studies and merit further study, e.g. *Babesia spp.* [4], Coxsackie B virus [5], Japanese Encephalitis virus [6], *Leptospira spp.* [7], *Salmonella spp.* [8,9], *Wuchereria bancrofti* [10] and multiple gingival bacteria including *Fusobacterium nucleatum* [11,12]. Recognized, common adverse pregnancy outcomes: a – first trimester fetal death; b – second trimester fetal death; c – stillbirth; d – preterm labor; e – intrauterine growth restriction; f – fetal hydrops; g – severe neonatal infection; h – increased severity of maternal disease. Type: (B)acterial, (V)iral or (P)protozoan. Adult Tx: most common route of transmission to adult humans. Lifestyle: I = intracellular; E = extracellular. Known tropisms = cells infected. * - *Treponema pallidum* is generally thought to be extracellular; however, it has been documented in non-phagocytic intracellular compartments both *in vivo* and *in vitro* [13].

Pathogen (Illness)	Type	Adult Tx	Lifestyle	Known tropisms
<i>Brucella spp.</i> (Brucellosis) ^{a, b, c, d, e} [14]	B	Ingestion	Primarily I	Leukocytes, epithelial
<i>Coxiella burnetii</i> (Q fever) ^{c, e, h} [15,16]	B	Inhalation	Obligate I	Leukocytes
<i>Listeria monocytogenes</i> (Listeriosis) ^{a, b, c, d, g, h} [17]	B	Ingestion	I / E	Epithelial, phagocytes
<i>Mycobacterium tuberculosis</i> (TB) ^{d, g} [18]	B	Airborne	Primarily I	Leukocytes
<i>Treponema pallidum</i> (Syphilis) ^{b, c, f, g} [19,20]	B	Sexual	Primarily E*	Unknown
<i>Leishmania spp.</i> (Leishmaniasis) ^h [21,22]	P	Vector	I / E	Leukocytes
<i>Plasmodium falciparum</i> (Malaria) ^{b, c, e, g, h} [23]	P	Vector	Obligate I	Erythrocytes, hepatocytes
<i>Toxoplasma gondii</i> (Toxoplasmosis) ^{a, b, d, g} [24]	P	Ingestion	Obligate I	All nucleated cells
<i>Trypanosoma spp.</i> (Chagas disease, African sleeping sickness) ^{e, g} [25]	P	Vector	I / E	Epi/endothelial
Cytomegalovirus (CMV) ^{a, b, d, g} [26,27]	V	Droplet	Obligate I	Leukocytes, trophoblasts
Lymphocytic choriomeningitis virus (LCMV) ^{a, b, f, g} [28,29]	V	Ingestion, Inhalation	Obligate I	Leukocytes
Parvovirus B19 ^{a, b, c, d, f} [30,31]	V	Droplet	Obligate I	Hematopoietic, endothelial
Rubella virus (German measles) ^g [32]	V	Droplet	Obligate I	Many
Varicella zoster virus (Chicken pox) ^{g, h} [33]	V	Airborne	Obligate I	Leukocytes, neurons, epithelial

References

1. Avgil M, Ornoy A: **Herpes simplex virus and epstein-barr virus infections in pregnancy: Consequences of neonatal or intrauterine infection.** *Reprod Toxicol* (2006) **21**(4):436-445.
2. Chang MH: **Hepatitis B virus infection.** *Semin Fetal Neonatal Med* (2007) **12**(3):160-167.
3. Biggar RJ, Miotti PG, Taha TE, Mtimavalye L, Broadhead R, Justesen A, Yellin F, Liomba G, Miley W, Waters D, Chiphangwi JD *et al*: **Perinatal intervention trial in africa: Effect of a birth canal cleansing intervention to prevent HIV transmission.** *Lancet* (1996) **347**(9016):1647-1650.
4. Fox LM, Wingerter S, Ahmed A, Arnold A, Chou J, Rhein L, Levy O: **Neonatal babesiosis: Case report and review of the literature.** *Pediatr Infect Dis J* (2006) **25**(2):169-173.
5. Watson WJ, Awadallah S, Jaqua MJ: **Intrauterine infection with coxsackievirus: Is it a cause of congenital cardiac malformations?** *Infect Dis Obstet Gynecol* (1995) **3**(2):79-81.
6. McGovern LM, Boyce TG, Fischer PR: **Congenital infections associated with international travel during pregnancy.** *J Travel Med* (2007) **14**(2):117-128.

7. Shaked Y, Shpilberg O, Samra D, Samra Y: **Leptospirosis in pregnancy and its effect on the fetus: Case report and review.** *Clin Infect Dis* (1993) **17**(2):241-243.
8. Schloesser RL, Schaefer V, Groll AH: **Fatal transplacental infection with non-typhoidal *Salmonella*.** *Scand J Infect Dis* (2004) **36**(10):773-774.
9. Ghenghesh KS, Franka E, Tawil K, Wasfy MO, Ahmed SF, Rubino S, Klena JD: **Enteric fever in mediterranean North Africa.** *J Infect Dev Ctries* (2009) **3**(10):753-761.
10. A NH, Scaff LM: **[verification of congenital *Wuchereria bancrofti* microfilaremia].** *Rev Bras Malaria Doencas Trop* (1955) **6**(2):283-284.
11. Han YW, Fardini Y, Chen C, Iacampo KG, Peraino VA, Shamoni JM, Redline RW: **Term stillbirth caused by oral *Fusobacterium nucleatum*.** *Obstet Gynecol* (2010) **115**(2 Pt 2):442-445.
12. Shira Davenport E: **Preterm low birthweight and the role of oral bacteria.** *J Oral Microbiol* (2010) **2**(

13. Sykes JA, Kalan J: **Intracellular *Treponema pallidum* in cells of a syphilitic lesion of the uterine cervix.** *Am J Obstet Gynecol* (1975) **122**(3):361-367.
14. Khan MY, Mah MW, Memish ZA: **Brucellosis in pregnant women.** *Clin Infect Dis* (2001) **32**(8):1172-1177.
15. Carcopino X, Raoult D, Bretelle F, Boubli L, Stein A: **Q fever during pregnancy: A cause of poor fetal and maternal outcome.** *Ann N Y Acad Sci* (2009) **1166**(79-89).
16. Stein A, Raoult D: **Q fever during pregnancy: A public health problem in Southern France.** *Clin Infect Dis* (1998) **27**(3):592-596.
17. Lamont RF, Sobel J, Mazaki-Tovi S, Kusanovic JP, Vaisbuch E, Kim SK, Uldbjerg N, Romero R: **Listeriosis in human pregnancy: A systematic review.** *J Perinat Med* (2011) **39**(3):227-236.
18. Peng W, Yang J, Liu E: **Analysis of 170 cases of congenital TB reported in the literature between 1946 and 2009.** *Pediatr Pulmonol* (2011).
19. Schulz KF, Cates W, Jr., O'Mara PR: **Pregnancy loss, infant death, and suffering: Legacy of syphilis and gonorrhoea in Africa.** *Genitourin Med* (1987) **63**(5):320-325.

20. Caddy SC, Lee BE, Sutherland K, Robinson JL, Plitt SS, Read R, Singh AE: **Pregnancy and neonatal outcomes of women with reactive syphilis serology in alberta, 2002 to 2006.** *J Obstet Gynaecol Can* (2011) **33**(5):453-459.
21. Papageorgiou T, Pana Z, Tragiannidis A, Tsotoulidou V, Pratsiou E, Tzouvelekis G, Athanassiadou F: **The first case of congenital leishmaniasis in a female infant in Greece.** *J Paediatr Child Health* (2010) **46**(10):611-612.
22. Zinchuk A, Nadraga A: **Congenital visceral leishmaniasis in Ukraine: Case report.** *Ann Trop Paediatr* (2010) **30**(2):161-164.
23. Uneke CJ: **Impact of placental *Plasmodium falciparum* malaria on pregnancy and perinatal outcome in Sub-Saharan Africa: Part iii: Placental malaria, maternal health, and public health.** *Yale J Biol Med* (2008) **81**(1):1-7.
24. Weiss LM, Dubey JP: **Toxoplasmosis: A history of clinical observations.** *Int J Parasitol* (2009) **39**(8):895-901.
25. **Control of chagas disease.** *World Health Organ Tech Rep Ser* (2002) **905**(i-vi, 1-109, back cover).

26. Syggelou A, Iacovidou N, Kloudas S, Christoni Z, Papaevangelou V: **Congenital cytomegalovirus infection.** *Ann N Y Acad Sci* (2010) **1205**:144-147.
27. Lopez H, Benard M, Saint-Aubert E, Baron M, Martin H, Al Saati T, Plantavid M, Duga-Neulat I, Berrebi A, Cristini C, Arnaud C *et al*: **Novel model of placental tissue explants infected by cytomegalovirus reveals different permissiveness in early and term placentae and inhibition of indoleamine 2,3-dioxygenase activity.** *Placenta* (2011) **32**(7):522-530.
28. Jamieson DJ, Kourtis AP, Bell M, Rasmussen SA: **Lymphocytic choriomeningitis virus: An emerging obstetric pathogen?** *Am J Obstet Gynecol* (2006) **194**(6):1532-1536.
29. Barton LL, Mets MB: **Congenital lymphocytic choriomeningitis virus infection: Decade of rediscovery.** *Clin Infect Dis* (2001) **33**(3):370-374.
30. Johansson S, Buchmayer S, Harlid S, Iliadou A, Sjoholm M, Grillner L, Norman M, Sparen P, Dillner J, Cnattingius S: **Infection with Parvovirus B19 and herpes viruses in early pregnancy and risk of second trimester miscarriage or very preterm birth.** *Reprod Toxicol* (2008) **26**(3-4):298-302.
31. Brolden K, Tolfvenstam T, Norbeck O: **Clinical aspects of Parvovirus B19 infection.** *J Intern Med* (2006) **260**(4):285-304.

32. Duszak RS: **Congenital rubella syndrome--major review.** *Optometry* (2009) **80**(1):36-43.

33. Smith CK, Arvin AM: **Varicella in the fetus and newborn.** *Semin Fetal Neonatal Med* (2009) **14**(4):209-217.