

Supplementary Appendix to Filardo TD, Masters NB, Leung J, Baca S, Egwuogu H, Guevara OR, Raykin J, Sugerman DE. Appropriateness of Immunoglobulin M testing for Measles, Mumps, and Rubella, *American Journal of Preventive Medicine*.

Identification of Diagnostic Codes Used to Assess Appropriate IgM Testing

The top 20 diagnostic codes associated with IgG, IgM, and PCR testing (within 7 days before and after the lab test) were identified. Test codes associated with PCR testing that were indicative of evaluation for acute symptoms or syndromes (e.g., B09 - Unspec viral infection characterized by skin & mucous membrane lesions) were identified and flagged as likely indicative of an evaluation for acute infection. Diagnostic codes which were not indicative of evaluation for an acute syndrome (e.g., R7303-Prediabetes) were excluded. This generated a list of diagnostic codes most suggestive of evaluation for acute measles, mumps, and rubella (**Appendix Table 1**). This list of diagnostic codes may not fully represent all instances where a clinician was evaluating for acute symptoms, but likely capture a large majority of instances. Inclusion of diagnostic code Z20822 (Contact with and (suspected) exposure to COVID) was retained for measles despite a lack of connection to measles, given the possibility that clinicians intended to indicate contact with a viral communicable disease (e.g., code Z20828).

Appendix Table 1. Diagnostic Codes used to Assess Appropriate IgM Testing for Measles, Mumps, and Rubella within 7 days of IgM lab test

Disease	ICD-10 Codes Most Frequently associated with use of RT-PCR Testing	
Measles	B05.xx	Measles
	B059	Measles without complication
	B09	Unspec viral infection characterized by skin & mucous membrane lesions
	J020	Streptococcal pharyngitis
	J029	Acute pharyngitis, unspecified
	J069	Acute upper respiratory infection, unspecified
	R059	Cough, unspecified
	R21	Rash and other nonspecific skin eruption
	R509	Fever, unspecified
	R5383	Other fatigue
	Z20822	Contact with and (suspected) exposure to COVID
Mumps	B26.xx	Mumps
	B269	Mumps without complication
	B349	Viral infection, unspecified
	I889	Nonspecific lymphadenitis, unspecified
	J029	Acute pharyngitis, unspecified
	J069	Acute upper respiratory infection, unspecified
	K1120	Sialoadenitis, unspecified
	K1121	Acute sialoadenitis
	K118	Other diseases of salivary glands
	R220	Localized swelling, mass and lump, head
	R221	Localized swelling, mass and lump, neck
	R509	Fever, unspecified
	R590	Localized enlarged lymph nodes
	R591	Generalized enlarged lymph nodes
	R599	Enlarged lymph nodes, unspecified
	R609	Edema, unspecified
	Z20828	Contact with and (suspected) exposure to oth viral communicable diseases
Rubella	B06.xx	Rubella
	B09	Unspec viral infection characterized by skin & mucous membrane lesions
	B349	Viral infection, unspecified
	J029	Acute pharyngitis, unspecified
	O26842	Uterine size-date discrepancy, second trimester
	O283	Abnormal ultrasonic finding on antenatal screening of mother
	O358XX0	MTL care for other (suspect) fetal abnormality and damage, N/A or unspec
	O358XX1	Maternal care for other (suspect) fetal abnormality and damage, fetus 1
	O365920	MTL care oth known/suspect poor fetal growth, 2nd trimester, N/A or NOS
	O98512	Other viral diseases complicating pregnancy, second trimester
	R21	Rash and other nonspecific skin eruption
	R509	Fever, unspecified
	Z204	contact with and (suspected) exposure to rubella

Note: Diagnostic codes associated with use of RT-PCR testing, but found not to indicate evaluation for any acute condition (e.g., R7303 – Prediabetes, I10 – Essential (primary) hypertension), were excluded.

Pregnancy Algorithm

Pregnancies were identified through codes associated with birth outcomes (e.g., live birth, stillbirth, ectopic pregnancy, abortion). The pregnancy identification algorithm was adapted from Moll et al. (2021) and Naleway et al (2021) using the endpoints and outcomes identified; codes used to identify live births are detailed in Appendix Table 2. For other gestational outcomes, please refer to the supplemental material files in Moll et al. (2021)^{1,2}. The main difference between this and other papers is the inclusion of gestational age-related codes in weeks Z3A.XX; these codes are given higher priority than trimester-related codes. This is because these are gestational age-related codes in weeks. The frequency of visit, according to the American Academy of Pediatrics, is one visit every 4 weeks until week 28, every 2 weeks until week 36, and weekly until delivery³. As this analysis used closed claims, it is likely gestational age-related codes would be captured. If these weekly gestational age codes are not found, the procedure outlined in Moll et al. (2021) is followed, using spacing requirements and validating for conflicting outcomes within and outside every pregnancy episode for every patient.

Appendix Table 2. Pregnancy Algorithm Codes

Code	Code description/note
<i>Pregnancy</i>	
ICD-10-CM O75.82, O80, Z37.0, Z37.1, Z37.9	Pregnancy endpoint, diagnosis code
ICD-10-PCS 10D00Z0, 10D00Z1, 10D00Z2, 10D07Z3, 10D07Z4, 10D07Z5, 10D07Z6, 10D07Z7, 10D07Z8, 10E0XZZ	Pregnancy endpoint, procedure codes
DRG 765, 766, 767, 768, 774, 775, 783, 784, 785, 786, 787, 788, 796, 797, 798, 805, 806, 807	Pregnancy endpoint, DRG codes
ICD-10 Z37.0, O80, Z37.5X, Z37.3, Z37.6X	Live birth outcome
ICD-10-CM Z3A.XX	Gestational age codes in weeks, all the other remaining gestational age codes in trimester can be found in the supplementary file 1 from Moll et al ²

Abbreviations: ICD-10-CM, International Classification of Disease, 10th Revision, Clinical Modification; DRG, diagnosis related group

References

1. Moll K, Wong HL, Fingar K, Hobbi S, Sheng M, Burrell TA, Eckert LO, Munoz FM, Baer B, Shoaibi A, Anderson S. Validating claims-based algorithms determining pregnancy outcomes and gestational age using a linked claims-electronic medical record database. *Drug Saf* 2021; 44: 1151-1164.
2. Naleway AL, Crane B, Irving SA, Bachman D, Vesco KK, Daley MF, Getahun D, Glenn SC, Hambidge SJ, Jackson LA, Klein NP, McCarthy NL, McClure DL, Panagiotakopoulos L, Panozzo CA, Vazquez-Benitez G, Weintraub ES, Zerbo O, Kharbanda EO. Vaccine Safety Datalink infrastructure enhancements for evaluating the safety of maternal vaccination. *Ther Adv Drug Saf* 2021; 12: 20420986211021233.
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