

TB Publications

As of September, 2022

Clinical Publication							
Year	Title	Journal / Publication	Key Words	Region	Country	Delft's Solution	Link
2022	The performance of computer-aided detection digital chest X-ray reading technologies for triage of 2 active Tuberculosis among persons with a history of previous Tuberculosis	Clinical Infectious Diseases	Persons with previously treated TB	Africa	Zambia	CAD4TB (ver.7)	https://doi.org/10.1093/cid/ciac679
2022	Portable digital X-ray for TB pre-diagnosis screening in rural communities in Nigeria	Public Health Action	Active case finding	Africa	Nigeria	Delft Light CAD4TB (ver.6)	https://pubmed.ncbi.nlm.nih.gov/35734009/
2022	Population-wide active case finding and prevention for tuberculosis and leprosy elimination in Kiribati: the PEARL study protocol	BMJ Open	Active case finding	Asia	Kiribati	CAD4TB (ver.6)	https://bmiopen.bmi.com/content/12/4/e055295?rss=1
2022	Integrated screening and testing for TB and COVID-19 in Peru	Public Health Action	TB & COVID-19	Latin America	Peru	CAD4TB CAD4COVID	https://doi.org/10.5588/pha.21.0077
2021	Triage of Persons With Tuberculosis Symptoms Using Artificial Intelligence–Based Chest Radiograph Interpretation: A Cost-Effectiveness Analysis	Open Forum Infectious Diseases	Cost effectiveness	Asia	Pakistan	CAD4TB (ver.6)	https://doi.org/10.1093/ofid/ofab567
2021	Accuracy of computer-aided chest X-ray screening in the Kenya National Tuberculosis Prevalence Survey	MedRxiv	Performance evaluation, community-based screening, prevalence	Africa	Kenya	CAD4TB (ver.6)	https://doi.org/10.1101/2021.10.21.21265321
2021	Early TB case detection by community-based mobile X-ray screening and Xpert testing in Balochistan	Public Health Action	Community-based screening	Asia	Pakistan	CAD4TB	https://doi.org/10.5588/pha.21.0050
2021	Computer-aided X-ray screening for tuberculosis and HIV testing among adults with cough in Malawi (the PROSPECT study): A randomised trial and cost-effectiveness analysis	PLOS Medicine	TB/HIV	Africa	Malawi	CAD4TB (ver.5)	https://doi.org/10.1371/journal.pmed.1003752
2021	Use of targeted mobile X-ray screening and computer-aided detection software to identify tuberculosis among high-risk groups in Romania: descriptive results of the E-DETECT TB active case-finding project	BMJ Open	Active case finding	Europe	Romania	CAD4TB (ver.6) CAD4TB (ver.5)	https://bmiopen.bmi.com/content/11/8/e045289
2021	Computer-aided interpretation of chest radiography reveals the spectrum of tuberculosis in rural South Africa	npj Digital Medicine	Active case finding, TB/HIV	Africa	South Africa	CAD4TB (ver.6) CAD4TB (ver.5)	https://doi.org/10.1038/s41746-021-00471-y
2020	Automated chest radiography and mass systematic screening for tuberculosis	The International Journal of Tuberculosis and Lung Disease	Systematic screening	Asia	Pakistan	CAD4TB	https://doi.org/10.5588/ijtld.19.0501
2020	Evaluation of computer aided detection of tuberculosis on chest radiography among people with diabetes in Karachi Pakistan	Nature Scientific Reports	TB / Diabetes Mellitus (DM)	Asia	Pakistan	CAD4TB (ver. 3.07)	https://doi.org/10.1038/s41598-020-63084-7
2020	Computer Aided Detection of Tuberculosis on Chest Radiographs: An Evaluation of the CAD4TB v6 system	Nature Scientific Reports	Cost effectiveness, performance evaluation	Asia	Pakistan, Netherlands	CAD4TB (ver.6)	https://doi.org/10.1038/s41598-020-62148-y
2020	Symptom and Digital Chest X-ray TB Screening in South African Prisons: Yield and Cost Effectiveness	The International Journal of Tuberculosis and Lung Disease	Cost effectiveness, performance evaluation	Africa	South Africa	CAD4TB	https://doi.org/10.5588/ijtld.19.0214
2020	A Public-Private Model to Scale Up Diabetes Mellitus Screening Among People Accessing Tuberculosis Diagnostics in Dhaka, Bangladesh	The International Journal of Tuberculosis and Lung Disease	TB / Diabetes Mellitus (DM)	Asia	Bangladesh	CAD4TB (ver.3.07) Easy DR X-ray	https://doi.org/10.1016/j.ijtld.2020.01.001
2020	Yield, Efficiency and Costs of Mass Screening Algorithms for Tuberculosis in Brazilian Prisons	Clinical infectious diseases	Cost effectiveness, active case finding, prevalence survey, prison screening	Latin America	Brazil	CAD4TB	https://doi.org/10.1093/cid/ciaa135
2020	Deep learning, Computer-Aided Radiography Reading for Tuberculosis: a Diagnostic Accuracy Study from a Tertiary Hospital in India	Nature Scientific Reports	Performance evaluation	Asia	India	CAD4TB (ver.6) as reference	https://doi.org/10.1038/s41598-019-56589-3
2019	Prevalence of Tuberculosis, HIV/AIDS, and Hepatitis; in a Prison of Balochistan: a Cross-Sectional Survey	BMC public health	TB/HIV, active case finding, prevalence survey, prison screening	Asia	Pakistan	CAD4TB	https://doi.org/10.1186/s12889-019-8011-7
2019	Automated Chest X-ray Reading for Tuberculosis in the Philippines to Improve Case Detection: a Cohort Study	The International Journal of Tuberculosis and Lung Disease	Performance evaluation	Asia	Philippines	CAD4TB (ver.5)	https://doi.org/10.5588/ijtld.18.0004
2018	Computer-Assisted Chest Radiography Reading for Tuberculosis Screening in People Living with Diabetes Mellitus	The International Journal of Tuberculosis and Lung Disease	TB / Diabetes Mellitus (DM)	Asia	Indonesia	CAD4TB (ver.5)	https://doi.org/10.5588/ijtld.17.0827
2018	Evaluation of the Diagnostic Accuracy of Computer-Aided Detection of Tuberculosis on Chest Radiography Among Private Sector Patients in Pakistan	Nature Scientific Reports	Cost effectiveness	Asia	Pakistan	CAD4TB (ver. 3.07)	https://doi.org/10.1038/s41598-018-30810-1
2018	Accuracy of an Automated System for Tuberculosis Detection on Chest Radiographs in High-risk Screening	The International Journal of Tuberculosis and Lung Disease	Cost effectiveness, active case finding	Europe	UK	CAD4TB (ver.5)	10.5588/ijtld.17.0492

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2017	Computer-Aided Reading of Tuberculosis Chest Radiography: Moving the Research Agenda Forward to Inform Policy	European Respiratory Journal	Research agenda	-	-	CAD4TB	https://eri.ersjournals.com/content/50/1/1700953
2017	Automatic Versus Human Reading of Chest X-rays in the Zambia National Tuberculosis Prevalence Survey	The International Journal of Tuberculosis and Lung Disease	Performance evaluation, prevalence survey	Africa	Zambia	CAD4TB (ver.5)	https://www.diagnijmegen.nl/publications/mele17/
2017	Digital CXR with Computer-Aided Diagnosis Versus Symptom Screen to Define Presumptive Tuberculosis Among Households Contacts and Impact on Tuberculosis Diagnosis	BMC Infectious Diseases	Household contact	Africa	Zambia	CAD4TB (ver.1.08)	https://doi.org/10.1186/s12879-017-2388-7
2017	An Evaluation of Automated Chest Radiography Reading Software for Tuberculosis Screening Among Public- and Private-sector Patients	European Respiratory Journal	Cost effectiveness	Asia	Bangladesh	CAD4TB (ver. 3.07)	https://eri.ersjournals.com/content/49/5/1602159
2016	An Automated Tuberculosis Screening Strategy Combining X-ray Based Computer-Aided Detection and Clinical Information	Nature Scientific Reports	Performance evaluation	Africa	South Africa	EZ DR X-ray CAD4TB (ver. 3.07) Odelca DR	https://doi.org/10.1038/srep25265
2015	Screening for Pulmonary Tuberculosis in a Tanzanian Prison and Computer-Aided Interpretation of Chest X-rays	Public Health Action	Active case finding, prison screening, performance evaluation	Africa	Tanzania	CAD4TB (ver. 3.07) Odelca DR	https://doi.org/10.5588/pha.15.0037
2015	Automated Chest-radiography as a Triage for Xpert Testing in Resource-Constrained Settings: a Prospective Study of Diagnostic Accuracy and Costs.	Nature Scientific Reports	Cost effectiveness	Africa	South Africa	CAD4TB (ver. 3.07) Odelca DR	https://doi.org/10.1038/srep12215
2015	Computerized Reading of Chest Radiographs in The Gambia National Tuberculosis Prevalence Survey: Retrospective Comparison with Human Experts	Proceeding from Union World Conference on Lung Health	Performance evaluation	Africa	Gambia	CAD4TB	http://www.diagnijmegen.nl/index.php/Publication?bibkey=Madu15
2015	Objective Computerized Chest Radiography Screening to Detect Tuberculosis in the Philippines	Proceeding from Union World Conference on Lung Health	Performance evaluation, prison screening	Asia	Philippines	CAD4TB (ver. 4.10)	http://www.diagnijmegen.nl/index.php/Publication?bibkey=Phil15a
2014	Diagnostic Accuracy of Computer-Aided Detection of Pulmonary Tuberculosis in Chest Radiographs: A Validation Study from Sub-Saharan Africa	PLOS one	Performance evaluation	Africa	Tanzania	CAD4TB (ver. 3.07)	https://doi.org/10.1371/journal.pone.0106381
2014	The Sensitivity and Specificity of Using a Computer Aided Diagnosis Program for Automatically Scoring Chest X-Rays of Presumptive TB Patients Compared with Xpert MTB/RIF in Lusaka Zambia	PLOS one	Performance evaluation, TB/HIV	Africa	Zambia	CAD4TB (ver.1.08)	https://doi.org/10.1371/journal.pone.0093757
2014	Detection of Chest X-ray abnormalities and tuberculosis using computer-aided detection vs interpretation by radiologists and a clinical officer	Proceeding from Union World Conference on Lung Health	Performance evaluation	Asia	Pakistan	CAD4TB (ver. 3.07)	https://www.diagnijmegen.nl/publications/khan14/
2013	Detection of Tuberculosis Using Digital Chest Radiography: Automated Reading vs. Interpretation by Clinical Officers	The International Journal of Tuberculosis and Lung Disease, European respiratory Journal	Performance evaluation	Africa	Zambia	CAD4TB (ver.1.08) Odelca DR	https://doi.org/10.5588/ijtld.13.0325

Technical Publication							
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2022	Comparing different versions of computer-aided detection products when reading chest X-rays for tuberculosis	PLOS Digital Health	Performance comparison of CAD software	Asia	Bangladesh	CAD4TB (ver.6 & 7)	https://doi.org/10.1371/journal.pdig.0000067
2022	"Similar performances but markedly different triaging thresholds in three CAD4TB versions risk systematic errors in TB screening programs"	MedRxiv	Performance comparison of CAD software	Africa	South Africa	CAD4TB (ver.5, 6, 7)	https://doi.org/10.1101/2022.04.29.22274472
2022	Diagnostic accuracy of chest X-ray interpretation for tuberculosis by three artificial intelligence-based software in a screening use-case: an individual patient meta-analysis of global data	MedRxiv	Performance comparison of CAD software	Various	Various	CAD4TB (ver.6)	https://doi.org/10.1101/2022.01.24.22269730
2021	Independent evaluation of 12 artificial intelligence solutions for the detection of tuberculosis	Nature Scientific Reports	Performance comparison of CAD software	Asia	Vietnam	CAD4TB (ver.7)	https://doi.org/10.1038/s41598-021-03265-0
2021	Tuberculosis detection from chest x-rays for triaging in a high tuberculosis-burden setting: an evaluation of five artificial intelligence algorithms	The Lancet Digital Health	Performance comparison of CAD software	Asia	Bangladesh	CAD4TB (ver.7) Easy DR	https://www.thelancet.com/journals/landig/article/PIIS2589-7500(21)00116-3/fulltext
2021	Chest X-ray analysis with deep learning-based software as a triage test for pulmonary tuberculosis: an individual patient data meta-analysis of diagnostic accuracy	Clinical Infectious Diseases	Performance comparison of CAD software	Global	Pakistan, South Africa, Tanzania,	CAD4TB (ver.6)	https://doi.org/10.1093/cid/ciab639
2021	Can artificial intelligence (AI) be used to accurately detect tuberculosis (TB) from chest X-rays? An evaluation of five AI products for TB screening and triaging in a high TB burden setting	ArXiv	Performance comparison of CAD software	Asia	Bangladesh	CAD4TB (ver.7)	https://arxiv.org/ftp/arxiv/papers/2006/2006.05509.pdf
2021	Application of artificial intelligence in digital chest radiography reading for pulmonary tuberculosis screening	Chronic Diseases and Translational Medicine	Review of CAD related articles	All	All	CAD4TB (ver.6)	https://doi.org/10.1016/i.cdtm.2021.02.001

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2021	A new resource on artificial intelligence powered computer automated detection software products for tuberculosis programmes and implementers	Tuberculosis	Performance comparison of CAD software	All	All	CAD4TB (ver.6)	https://doi.org/10.1016/j.tube.2020.102049
2020	Chest X-ray Analysis with Deep Learning-Based Software as a Triage Test for Pulmonary Tuberculosis: a Prospective Study of Diagnostic Accuracy for Culture-Confirmed Disease	The Lancet Digital Health	WHO criteria, performance comparison of CAD software	Asia	Pakistan	CAD4TB (ver.6)	https://www.thelancet.com/journals/landig/article/PIIS2589-7500(20)30221-1/fulltext
2020	Can Artificial Intelligence Be Used to Accurately Detect Tuberculosis (TB) from Chest X-ray? A Multi-Platform Evaluation of Five AI Products Used for TB Screening in a High-Burden setting	ArXiv	Performance comparison of CAD software	Asia	Bangladesh	CAD4TB (ver.6)	https://doi.org/10.48550/arXiv.2006.05509
2019	Using Artificial Intelligence to Read Chest Radiographs for Tuberculosis Detection: A Multi-Site Evaluation of the Diagnostic Accuracy of Three Deep Learning Systems	Nature Scientific Reports	Performance comparison of CAD software	Asia, Africa	Nepal, Cameroon	CAD4TB	https://doi.org/10.1038/s41598-019-51503-3
2019	A systematic review of the diagnostic accuracy of artificial intelligence-based computer programs to analyze chest X-rays for pulmonary tuberculosis	PLOS one	Review of CAD related articles			CAD4TB	https://doi.org/10.1371/journal.pone.0221339
2017	Fast and Effective Quantification of Symmetry in Medical Images for Pathology Detection: Application to Chest Radiography	Medical Physics	Symmetry computation				https://doi.org/10.1002/mp.12127
2016	Automatic Detection of Pleural Effusion in Chest Radiographs	Medical Image Analysis	Detect pleural effusion (PE)				https://doi.org/10.1016/j.media.2015.09.004
2016	Computer-Aided Detection of Pulmonary Tuberculosis on Digital Chest Radiographs: a Systematic Review	The International Journal of Tuberculosis and Lung Disease	Systematic review			CAD4TB	https://doi.org/10.5588/ijtld.15.0926
2015	On Combining Multiple-Instance Learning and Active Learning for Computer-Aided Detection of Tuberculosis	IEEE Transactions on Medical Imaging					https://ieeexplore.ieee.org/document/7347438/
2015	Localized energy-based normalization of medical images: application to chest radiography	IEEE Transactions on Medical Imaging					https://ieeexplore.ieee.org/document/7073580
2015	Automatic Detection of Tuberculosis in Chest Radiographs Using a Combination of Textural, Focal, and Shape Abnormality Analysis	IEEE Transactions on Medical Imaging					https://ieeexplore.ieee.org/document/7045613
2014	A Novel Multiple-Instance Learning-Based Approach to Computer-Aided Detection of Tuberculosis on Chest X-Rays	IEEE Transactions on Medical Imaging					https://ieeexplore.ieee.org/document/6882215
2014	Cavity Contour Segmentation in Chest Radiographs Using Supervised Learning and Dynamic Programming	Medical Physics					https://doi.org/10.1118/1.4881096
2014	Multiple-instance learning for computer-aided detection of tuberculosis	Medical Imaging					https://doi.org/10.1117/12.2043018
2013	Suppression of Translucent Elongated Structures: Applications in Chest Radiography	IEEE Transactions on Medical Imaging					https://ieeexplore.ieee.org/document/6564454
2013	Foreign Object Detection and Removal to Improve Automated Analysis of Chest Radiographs	Medical Physics					https://doi.org/10.1118/1.4805104
2013	Automated Localization of Costophrenic Recesses and Costophrenic Angle Measurement on Frontal Chest Radiographs	Proceeding from SPIE Medical Imaging 2013					https://doi.org/10.1117/12.2008239
2013	Improved Texture Analysis for Automatic Detection of Tuberculosis (TB) on Chest Radiographs with Bone Suppression Images	Proceeding from SPIE Medical Imaging 2013					https://doi.org/10.1117/12.2008083
2012	Clavicle segmentation in chest radiographs	Medical Image Analysis					http://dx.doi.org/10.1016/j.media.2012.06.009
2010	Fusion of local and global detection systems to detect tuberculosis in chest radiographs	Medical Image Computing and Computer-Assisted Intervention					https://link.springer.com/chapter/10.1007%2F978-3-642-15711-0_81
2010	Rib Suppression in Chest Radiographs to Improve Classification of Textural Abnormalities	Proceeding from SPIE Medical Imaging 2010					https://doi.org/10.1117/12.844409
2009	Dissimilarity-based Classification in the Absence of Local Ground Truth: Application to the Diagnostic Interpretation of Chest Radiographs	Pattern Recognition					https://doi.org/10.1016/j.patcog.2009.01.016

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2007	Computer-aided detection of interstitial abnormalities in chest radiographs using a reference standard based on computed tomography	Medical Physics					https://doi.org/10.1118/1.2795672
2006	Segmentation of Anatomical Structures in Chest Radiographs Using Supervised Methods: a Comparative Study on a Public Database	Medical Image Analysis	Lung segmentation	-	-	-	https://doi.org/10.1016/j.media.2005.02.002
2002	Automatic Detection of Abnormalities in Chest Radiographs Using Local Texture Analysis	IEEE Transactions on Medical Imaging					https://ieeexplore.ieee.org/document/993132

Guidelines and policy papers							
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2022	Tuberculosis Prevention and Care Among Refugees and Other Populations in Humanitarian Settings: an interagency field guide	CDC, UNHCR, World Health Organization	Digital X-ray and CAD			CAD4TB	https://www.who.int/publications/i/item/9789240042087
2021	Screening and Triage for TB using Computer-Aided Detection (CAD) Technology and Ultra-portable X-Ray Systems: A Practical Guide	Stop TB Partnership	CAD for TB screening and triage Ultra-portable X-ray			CAD4TB Delft Light	https://www.stoptb.org/resources-implementing-cad-and-xray/cad-and-x-ray-practical-implementation-guide
2021	Programmatic innovations to address challenges in tuberculosis prevention and care during the COVID-19 pandemic	World Health Organization	TB and COVID-19			CAD4TB	https://www.who.int/publications/i/item/programmatic-innovations-to-address-challenges-in-tuberculosis-prevention-and-care-during-the-covid-19-pandemic
2021	Digital Chest Radiography and Computer-Aided Detection (CAD) Solutions for Tuberculosis Diagnostics - Technology Landscape Analysis	FIND	Digital X-ray and CAD			CAD4TB	https://www.finddx.org/wp-content/uploads/2021/04/FIND-CXR-CAD-solutions-for-TB-diagnostics-7Apr2021-2pg-spread.pdf
2021	WHO Consolidated guidelines on tuberculosis Module 2: Screening Systematic screening for tuberculosis disease	World Health Organization	CAD Recommendation			CAD4TB	https://apps.who.int/iris/bitstream/handle/10665/340256/9789240022614-eng.pdf
2021	WHO operational handbook on tuberculosis Module 2: Screening Systematic screening for tuberculosis disease	World Health Organization	CAD Recommendation			CAD4TB	https://apps.who.int/iris/bitstream/handle/10665/340255/9789240022676-eng.pdf
2020	Global Tuberculosis Report	World Health Organization				CAD4TB	https://apps.who.int/iris/bitstream/handle/10665/336069/9789240013131-eng.pdf?ua=1
2019	StopTB Partnership Field Guide on Chest X-ray Screening	StopTB Partnership				CAD4TB	https://stoptb-strategicinitiative.org/index.php/2019/04/17/stoptb-field-guide-8-chest-x-ray-screening/
2018	Mobile Care for TB Screening and Diagnosis - a How-To Guide	USAID/ChallengeTB	Mobile screening			CAD4TB Easy DR OneStopTB Clinic	https://www.challengeTB.org/publications/Challenge_TB_Mobile_Care_How_To.pdf
2017	Global investments in Tuberculosis research and development: past, present and future.	World Health Organization - Policy Paper for the first WHO Global Ministerial Conference on Ending Tuberculosis in the Sustainable	Automated imaging detection			CAD4TB	https://apps.who.int/iris/bitstream/handle/10665/259412/9789241513326-eng.pdf;jsessionid=7E0F217142B74E2DDE438FE6FB9AD925?sequence=1
2015	Chest Radiography in Tuberculosis Detection - Summary of Current WHO Recommendations and Guidance on Programmatic Approaches	World Health Organization	TB diagnostics pipeline			CAD4TB	https://apps.who.int/iris/bitstream/handle/10665/252424/9789241511506-eng.pdf?sequence=1
2015	WHO Compendium of Innovative Health Technologies for Low-Resource Settings	World Health Organization - Compendium of Innovative Technologies				CAD4TB	https://www.who.int/publications/i/item/9789241509992
2014	Tuberculosis - Diagnostics Technology and Market Landscape	UNITAID / World Health Organization	TB diagnostics technology landscape			CAD4TB EasyPortable	http://unitaid.org/assets/Tuberculosis_diagnostics_technology_and_market_landscape_4th_edition_Oct_2015.pdf
2012	Digital Imaging Innovations for Early TB Case Detection	StopTB Partnership / CheckTB	Active case finding			CAD4TB	https://stoptb.org/wg/new_diagnostics/assets/documents/F.vanDoren_CAD%20Digital%20X-ray.pdf