

Table S1. Context evaluation of tertiary hospitals (more than one option able to be selected)

Relevant content	Number (%) (n = 120)	95% Confidence interval
Concrete hospital policy for cervical length screening to prevent preterm births: <ul style="list-style-type: none"> There is a specific operating policy Screening is done in parallel with other duties (e.g., teaching; research; etc.) No policy 	<ul style="list-style-type: none"> 55 (45.8%) 32 (26.7%) 33 (27.5%) 	<ul style="list-style-type: none"> 37.2% to 54.7% 19.6% to 35.2% 20.3% to 36.1%
Working group or committee in place to implement preterm birth prevention: <ul style="list-style-type: none"> Working group established Only some personnel are assigned No assignment 	<ul style="list-style-type: none"> 31 (25.8%) 52 (43.3%) 37 (30.9%) 	<ul style="list-style-type: none"> 18.8% to 34.3% 34.8% to 52.3% 23.3% to 39.6%
Action plan to prevent preterm births in the hospital: <ul style="list-style-type: none"> Yes No 	<ul style="list-style-type: none"> 108 (90.0%) 12 (10.0%) 	<ul style="list-style-type: none"> 83.3% to 94.2% 5.8% to 16.7%
If action plan is established (n = 108/120): <ul style="list-style-type: none"> There is a monthly/quarterly/yearly operational planning meeting There is a meeting to report performance monthly/quarter/yearly A meeting or an activity is held occasionally 	<ul style="list-style-type: none"> 54/108 (50.0%) 58/108 (53.7%) 27/108 (25.0%) 	<ul style="list-style-type: none"> 40.7% to 59.3% 44.3% to 62.8% 17.8% to 33.9%
Have a role as a working physician in formulating policies relating to preterm birth prevention: <ul style="list-style-type: none"> Yes No 	<ul style="list-style-type: none"> 99 (82.5%) 21 (17.5%) 	<ul style="list-style-type: none"> 74.7% to 88.3% 11.7% to 25.3%
Encouragement is given by the Maternal and Child Health Board for the conduct of a cervical length screening program at the hospital: <ul style="list-style-type: none"> No Yes 	<ul style="list-style-type: none"> 42 (35.0%) 78 (65.0%) 	<ul style="list-style-type: none"> 27.1% to 43.9% 56.1% to 73.0%
Support is provided by the Maternal and Child Health Board for the implementation of a program of preterm birth prevention (n = 78/120): <ul style="list-style-type: none"> Micronized Progesterone vaginal soft-gel capsules (Utrogestan) Progesterone pessaries (Cyclogest) 17-OHPC (Proluton Depot) Funding for training of medical personnel in cervical length measurement Funding for the purchase of ultrasound equipment Other 	<ul style="list-style-type: none"> 46/78 (59.0%) 0 (0%) 37/78 (47.4%) 19/78 (24.4%) 14/78 (17.9%) 2/78 (2.6%) 	<ul style="list-style-type: none"> 47.9% to 69.2% 0.0% to 4.7% 36.7% to 58.4% 16.2% to 34.9% 11.0% to 27.9% 0.7% to 8.9%
Perception of the current role of the Maternal and Child Health Board in a cervical length screening program to prevent preterm births: <ul style="list-style-type: none"> No role at all Limited role Very active 	<ul style="list-style-type: none"> 24 (20.0%) 59 (49.2%) 37 (30.8%) 	<ul style="list-style-type: none"> 13.8% to 28.0% 40.4% to 58.0% 23.3% to 39.6%
Roles of the Maternal and Child Health Board that you would like to see or receive: <ul style="list-style-type: none"> Act as a policy maker and provide the main operation plans so that all hospitals operate in the same way and their performances can be compared Be the leader or individual responsible for an academic training program of cervical length screening for staff at a district hospital Responsible for providing medicines and medical supplies to all hospitals Other 	<ul style="list-style-type: none"> 32 (80.0%) 24 (20.0%) 59 (49.2%) 37 (30.8%) 	<ul style="list-style-type: none"> 65.2% to 89.5% 13.8% to 28.0% 40.4% to 58.0% 23.3% to 39.6%

Table S2. Availability of resources

Resources	Number (%) (n = 120)	95% Confidence interval
Hospital regularly employs an adequate number of obstetricians to meet workloads: <ul style="list-style-type: none"> No Yes 	<ul style="list-style-type: none"> 44 (36.7%) 76 (63.3%) 	<ul style="list-style-type: none"> 28.6% to 45.6% 54.4% to 71.4%
Hospital has obstetricians who can accurately perform cervical length measurements: <ul style="list-style-type: none"> No Yes, but not enough Yes, enough 	<ul style="list-style-type: none"> 3 (2.5%) 57 (47.5%) 60 (50.0%) 	<ul style="list-style-type: none"> 0.9% to 7.1% 38.8% to 56.4% 41.2% to 58.8%
Hospital has a person responsible for providing information on a preterm birth prevention program (Project Manager): <ul style="list-style-type: none"> Yes No 	<ul style="list-style-type: none"> 62 (51.7%) 58 (48.3%) 	<ul style="list-style-type: none"> 42.8% to 60.4% 39.6% to 57.2%
Hospital has a specific budget for cervical length measurement screening: <ul style="list-style-type: none"> Yes (funds are sourced from the district budget) No 	<ul style="list-style-type: none"> 13 (10.8%) 107 (89.2%) 	<ul style="list-style-type: none"> 6.4% to 17.7% 82.3% to 93.6%
Hospital has enough ultrasound machines that can be used for routine tasks: <ul style="list-style-type: none"> Not enough Enough 	<ul style="list-style-type: none"> 44 (36.7%) 76 (63.3%) 	<ul style="list-style-type: none"> 28.6% to 45.6% 54.4% to 71.4%
Hospital has an ultrasound machine that can be used specifically for a cervical length measurement screening program: <ul style="list-style-type: none"> No Yes 	<ul style="list-style-type: none"> 59 (49.2%) 61 (50.8%) 	<ul style="list-style-type: none"> 40.4% to 58.0% 42.0% to 59.6%

Table S3. Impact of preterm births on hospitals, pregnant women, and families

Hospital aspect	Number (%) (n = 120)	95% Confidence interval
Workload of the personnel involved: <ul style="list-style-type: none"> No effect Little effect Heavy effect 	<ul style="list-style-type: none"> 2 (1.7%) 22 (18.3%) 96 (80.0%) 	<ul style="list-style-type: none"> 0.5% to 5.9% 12.4% to 26.2% 72.0% to 86.2%
Expenses that the hospital has to bear: <ul style="list-style-type: none"> No effect Little effect Heavy effect 	<ul style="list-style-type: none"> 3 (2.5%) 16 (13.3%) 101 (84.2%) 	<ul style="list-style-type: none"> 0.9% to 7.1% 8.4% to 20.6% 76.6% to 89.6%
Length of hospital stays: <ul style="list-style-type: none"> No effect Little effect Heavy effect 	<ul style="list-style-type: none"> 7 (5.8%) 20 (16.7%) 93 (77.5%) 	<ul style="list-style-type: none"> 2.9% to 11.6% 11.1% to 24.4% 69.2% to 84.1%
Pregnant women and family aspects		

Family expenses: <ul style="list-style-type: none"> No effect Little effect Heavy effect 	<ul style="list-style-type: none"> 2 (1.7%) 22 (18.3%) 96 (80.0%) 	<ul style="list-style-type: none"> 0.5% to 5.9% 12.4% to 26.2% 72.0% to 86.2%
Problems with caring for the newborn: <ul style="list-style-type: none"> No effect Little effect Heavy effect 	<ul style="list-style-type: none"> 1 (0.8%) 8 (6.7%) 111 (92.5%) 	<ul style="list-style-type: none"> 0.2% to 4.6% 3.4% to 12.6% 86.4% to 96.0%
Problems in the life and work of the family members: <ul style="list-style-type: none"> No effect Little effect Heavy effect 	<ul style="list-style-type: none"> 2 (1.7%) 11 (9.2%) 107 (89.2%) 	<ul style="list-style-type: none"> 0.5% to 5.9% 5.2% to 15.7% 82.3% to 93.6%

Table S4. Assessment of project inputs

Input evaluation	Number (%) (n = 120)	95% Confidence interval
Realization at the hospital that preterm births present problems: <ul style="list-style-type: none"> Yes No 	<ul style="list-style-type: none"> 119 (99.2%) 1 (0.8%) 	<ul style="list-style-type: none"> 95.4% to 99.9% 0.2% to 4.6%
Overall degree of severity of the problems: <ul style="list-style-type: none"> Low Moderate High 	<ul style="list-style-type: none"> 4 (3.4%) 52 (43.7%) 63 (52.9%) 	<ul style="list-style-type: none"> 1.3% to 8.3% 34.8% to 52.3% 43.6% to 61.2%
Physicians can perform cervical length measurements by vaginal ultrasound: <ul style="list-style-type: none"> Yes (with related certification) Yes (without related certification) No 	<ul style="list-style-type: none"> 19 (15.8%) 96 (80.0%) 5 (4.2%) 	<ul style="list-style-type: none"> 10.4% to 23.4% 72.0% to 86.2% 1.8% to 9.4%
Usefulness of cervical length measurements to prevent preterm births (physicians' perspectives): <ul style="list-style-type: none"> Useless Somewhat useful Very useful 	<ul style="list-style-type: none"> 0 (0%) 30 (25.0%) 90 (75.0%) 	<ul style="list-style-type: none"> 0.0% to 3.1% 18.1% to 33.4% 66.6% to 81.9%
If cervical length measurements to prevent preterm births are deemed somewhat useful or useless (physicians' perspectives; n = 30/120): <ul style="list-style-type: none"> Perform cervical length measurements only in high-risk cases Use other screening tests; advise bed rest and drug usage Other 	<ul style="list-style-type: none"> 8/30 (26.6%) 3/30 (10.0%) 19/30 (63.4%) 	<ul style="list-style-type: none"> 14.2% to 44.5% 3.5% to 25.6% 45.5% to 78.1%
If cervical length measurements to prevent preterm births are deemed very useful (physicians' perspectives; n = 90/120): <ul style="list-style-type: none"> Establish a hospital policy to do as a stand-alone task Establish a hospital policy to do in conjunction with other screening tasks A hospital policy not required; screening can be performed as needed 	<ul style="list-style-type: none"> 40/90 (44.4%) 46/90 (51.1%) 5/90 (5.6%) 	<ul style="list-style-type: none"> 34.6% to 54.7% 41.0% to 61.2% 2.4% to 12.4%

Universal cervical length screening helps to reduce preterm births (n = 116/120): <ul style="list-style-type: none"> Agree; it would reduce the rate of preterm births Disagree; it would not affect the rate of preterm births 	<ul style="list-style-type: none"> 76/116 (65.5%) 40/116 (34.5%) 	<ul style="list-style-type: none"> 56.5% to 73.5% 26.5% to 43.5%
Awareness of the policy for universal cervical measurements for premature birth prevention included in the 2017 policy guidelines of the Ministry of Public Health: <ul style="list-style-type: none"> Aware Was not aware 	<ul style="list-style-type: none"> 88 (73.3%) 32 (26.7%) 	<ul style="list-style-type: none"> 64.8% to 80.4% 19.6% to 35.2%
If aware of the policy, level of agreement with the policy (n = 88/120): <ul style="list-style-type: none"> Agree Disagree Other 	<ul style="list-style-type: none"> 55/88 (62.5%) 20/88 (22.7%) 13/88 (14.8%) 	<ul style="list-style-type: none"> 52.1% to 71.9% 15.2% to 32.5% 8.8% to 23.7%
A fee for ultrasound screening: <ul style="list-style-type: none"> Should not be charged to pregnant women Should be charged to pregnant women 	<ul style="list-style-type: none"> 91 (75.8%) 29 (24.2%) 	<ul style="list-style-type: none"> 67.5% to 82.6% 17.4% to 32.6%
Willingness to work on a project to promote full implementation of universal cervical length screening: <ul style="list-style-type: none"> Not willing Willing 	<ul style="list-style-type: none"> 26 (21.7%) 94 (78.3%) 	<ul style="list-style-type: none"> 15.2% to 29.9% 70.2% to 84.8%
If not willing to work on the project (n = 26/120): <ul style="list-style-type: none"> Already have too much, or enough, full-time work Already have a substantial workload other than the regular job Do not think the preterm birth rate is such a severe problem that a program is needed Do not believe that cervical length screening plays a role in preventing preterm births Do not believe that cervical length screening to prevent preterm births is worth the requisite labor or funding Unsure of the accuracy of cervical length measurements Other 	<ul style="list-style-type: none"> 20/26 (76.9%) 14/26 (53.8%) 2/26 (7.7%) 3/26 (11.5%) 10/26 (38.5%) 7/26 (26.9%) 4/26 (15.4%) 	<ul style="list-style-type: none"> 58.0% to 89.0% 35.5% to 71.2% 2.1% to 24.1% 4.0% to 29.0% 22.4% to 57.5% 13.7% to 46.1% 6.2% to 33.5%

Table S5. Process evaluation of universal cervical length screening program

Process evaluation	Number (%) (n = 120)	95% Confidence interval
With reference to the policy of the Ministry of Public Health for universal cervical length screening to prevent preterm births, the situation in the hospital is: <ul style="list-style-type: none"> Screening is performed for every case Screening is performed for high-risk cases only No screening tests are performed 	<ul style="list-style-type: none"> 29 (24.2%) 73 (60.8%) 18 (15.0%) 	<ul style="list-style-type: none"> 17.4% to 32.6% 51.9% to 69.1% 9.7% to 22.5%
With reference to hospital guidelines for the performance of cervical length screening to prevent preterm births: <ul style="list-style-type: none"> Hospital guidelines are systematic and clear The content of hospital guidelines is inadequate or unclear (e.g., because of an over-reliance on an unhelpful format, such as a flow chart) No hospital guidelines have been established 	<ul style="list-style-type: none"> 33 (27.5%) 73 (60.8%) 14 (11.7%) 	<ul style="list-style-type: none"> 20.3% to 36.1% 51.9% to 69.1% 7.1% to 18.6%
If systematic guidelines or documentation is provided by the hospital, the situation with the real practice of following those guidelines and documents is (n = 106): <ul style="list-style-type: none"> They are not observed Only some parts are observed, or they are observed in whole only occasionally They are strictly observed 	(n = 106) <ul style="list-style-type: none"> 1/106 (0.9%) 79/106 (74.5%) 26/106 (24.5%) 	<ul style="list-style-type: none"> 0.2% to 5.2% 65.5% to 81.9% 17.3% to 33.5%

<p>If systematic guidelines or documentation is provided by the hospital, specific workloads are set for each physician (n = 106):</p> <ul style="list-style-type: none"> • Yes • No 	<p>(n = 106)</p> <ul style="list-style-type: none"> • 49/106 (46.2%) • 57/106 (53.8%) 	<ul style="list-style-type: none"> • 37.0% to 55.7% • 44.3% to 63.0%
<p>With reference to the broad policies of the Ministry of Public Health relating to the prevention of preterm births, the hospital has implemented those policies:</p> <ul style="list-style-type: none"> • Yes, it has • No, it has not 	<ul style="list-style-type: none"> • 89 (74.2%) • 31 (25.8%) 	<ul style="list-style-type: none"> • 65.7% to 81.2% • 18.8% to 34.3%
<p>There are problems when screening is performed for the target group (pregnant women who are at risk):</p> <ul style="list-style-type: none"> • No • Yes <p>Problems encountered:</p> <ul style="list-style-type: none"> ▪ Long waiting times ▪ Unsatisfactory service ▪ Cost ▪ Shyness/fear of examination/fear of pain ▪ Other (e.g., the patient declined a transvaginal ultrasound; late antenatal care; unable to attend appointment; delays associated with patient-preparation) 	<ul style="list-style-type: none"> • 46 (38.3%) • 74 (61.7%) ▪ 54 (45.0%) ▪ 12 (10.0%) ▪ 24 (20.0%) ▪ 40 (33.3%) ▪ 14 (11.7%) 	<ul style="list-style-type: none"> • 30.1% to 47.3% • 52.7% to 69.9% ▪ 36.4% to 53.9% ▪ 5.8% to 16.7% ▪ 13.8% to 28.0% ▪ 25.5% to 42.2% ▪ 7.1% to 18.6%

Table S6. Possible barriers to universal cervical length screening at hospitals

Possible barriers	Number (%) (n = 120)	95% Confidence interval
<p>Problems related to the physicians:</p> <ul style="list-style-type: none"> • Insufficient number of doctors available to perform the procedure • Doctors have other urgent and necessary tasks • Doctors have excessive routine tasks • Doctors do not think that premature births are such a severe problem that the scheme is required • Doctors do not think that cervical length screening plays a role in preventing preterm births • Doctors do not believe that universal cervical length screening to prevent preterm births can justify the requisite labor and funding • Doctors are unsure about the correct procedures for the measurements • Other 	<ul style="list-style-type: none"> • 51 (42.5%) • 63 (52.5%) • 78 (65.0%) • 4 (3.3%) • 28 (23.3%) • 37 (30.8%) • 50 (41.7%) • 9 (7.5%) 	<ul style="list-style-type: none"> • 34.0% to 51.4% • 43.6% to 61.2% • 56.1% to 73.0% • 1.3% to 8.3% • 16.7% to 31.7% • 23.3% to 39.6% • 33.2% to 50.6% • 4.0% to 13.6%
<p>Problems related to other personnel, such as nurses and administrative staff:</p> <ul style="list-style-type: none"> • Insufficient number of personnel to support the performance of the procedure • There are other tasks that are more urgent • The staff already have an excessive volume of routine tasks to perform • Lack of confidence that the collecting, recording, and analyzing of the data by non-medical personnel will be accurate • Other 	<ul style="list-style-type: none"> • 75 (62.5%) • 38 (31.7%) • 72 (60.0%) • 51 (42.5%) • 2 (1.7%) 	<ul style="list-style-type: none"> • 53.6% to 70.7% • 24.0% to 40.5% • 51.1% to 68.3% • 34.0% to 51.4% • 0.5% to 5.9%

Problems related to the hospital: <ul style="list-style-type: none"> • Hospital administrators ignore the issue • Lack of support for operating funds from government agencies • Lack of cost-free drug support (progesterone) for pregnant women with short cervixes to prevent preterm births • Other 	<ul style="list-style-type: none"> • 21 (17.5%) • 67 (55.8%) • 62 (51.7%) • 14 (11.7%) 	<ul style="list-style-type: none"> • 11.7% to 25.3% • 46.9% to 64.4% • 42.8% to 60.4% • 7.1% to 18.6%
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Table S7. Possible approaches to surmounting obstacles

Possible ways	Number (%) (n = 120)	95% Confidence interval
Relevant to physicians and/or related persons: <ul style="list-style-type: none"> • Add/request additional doctors who have the potential to screen cervical lengths using various methods • Provide regular training to physicians to enable them to confidently measure cervical lengths • Provide knowledge and skills relating to cervical length measurements for doctors who perform routine work so that they can become certificated and undertake examinations confidently • Provide reliable research results/demonstrations of the procedure/examples of screening results, and present doctors/nurses/other stakeholders with a detailed and convincing case for the cost-effectiveness of implementing universal cervical length screening • Reduce extraneous duties for doctors • Other 	<ul style="list-style-type: none"> • 42 (35.0%) • 68 (56.7%) • 68 (56.7%) • 48 (40.0%) • 51 (42.5%) • 5 (4.2%) 	<ul style="list-style-type: none"> • 27.1% to 43.9% • 47.7% to 65.2% • 47.7% to 65.2% • 31.7% to 48.9% • 34.0% to 51.4% • 1.8% to 9.4%
Relevant to hospitals: <ul style="list-style-type: none"> • Provide hospitals with adequate and regular funding from relevant agencies • Extend screening to community hospitals to relieve workloads at tertiary centers • Educate patients about the benefits of cervical length measurements to prevent preterm births • Other (providing adequate ultrasound machines and, in high-risk cases, administering appropriate preventative medications) 	<ul style="list-style-type: none"> • 92 (76.7%) • 84 (70.0%) • 78 (65.0%) • 4 (3.3%) 	<ul style="list-style-type: none"> • 68.3% to 83.3% • 61.3% to 77.5% • 56.1% to 73.0% • 1.3% to 8.3%
Monitoring of the systems related to, and evaluation of the results of, providing universal cervical length screening by the abovementioned approaches: <ul style="list-style-type: none"> • No aspects identified • Some aspects identified (n = 53) <ul style="list-style-type: none"> ▪ Objective ▪ Monitoring system ▪ Evaluation of screening results ▪ Treatment evaluation ▪ Assessment of the incidence of preterm births after project completion • All aspects 	<ul style="list-style-type: none"> • 56 (46.7%) • 53 (44.2%) <ul style="list-style-type: none"> ▪ 27/53 (50.9%) ▪ 9/53 (17.0%) ▪ 16/53 (30.2%) ▪ 15/53 (28.3%) ▪ 15/53 (28.3%) • 11 (9.2%) 	<ul style="list-style-type: none"> • 38.0% to 55.6% • 35.6% to 53.1% <ul style="list-style-type: none"> ▪ 37.9% to 63.9% ▪ 9.2% to 29.2% ▪ 19.5% to 43.5% ▪ 18.0% to 41.6% ▪ 18.0% to 41.6% • 5.2% to 15.7%