



PAPER BREATH



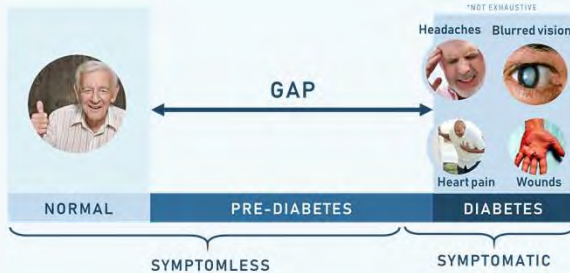
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PROBLEM

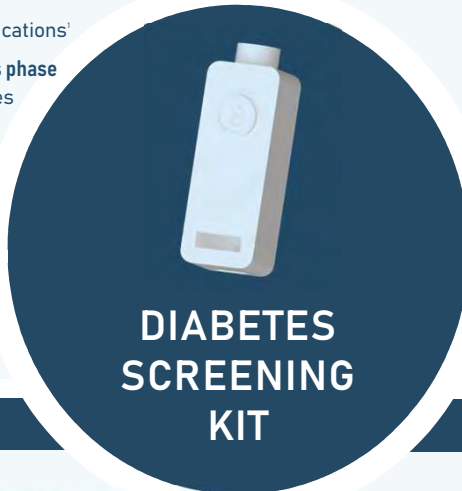
GAP IN EARLY DETECTION OF DIABETES



- Detected and treated in later stages
Poor recovery & higher risk of complications¹
- No obvious symptoms in early diabetes phase
Complacency & resistance to diabetes health screening
- At least 20% of a country's population are unknown diabetes cases².

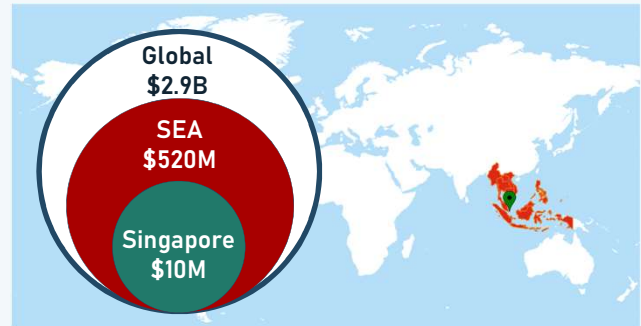
NEED

- Early detection
Cheap, quick & easy to use screening kit



DIABETES SCREENING KIT

MARKET



GLOBAL

46% increase in diabetic cases in 28 years
429 mil → 629 mil people in 2045

SOUTH EAST ASIA

Undiagnosed diabetic cases of the total population³
SEA (58%) vs Global average (46%)

SINGAPORE

GOAL: Uncover 20% undiagnosed cases in 6 years⁴
Reduce undiagnosed cases in 2019 from 50% to 30% in 2025

ADVANTAGES



	BLOOD TEST	ORAL GLUCOSE TOLERANCE TEST	GLUCOSE MONITOR	PAPER BREATH
HOME-BASED	X	X	✓	✓
EASY TO USE	X	X	✓	✓
NON-INVASIVE	X	✓	X	✓
QUICK	X	X	✓	✓
ACCURACY	✓✓	✓✓	✓✓	✓
AFFORDABLE	\$0-5*	\$20-50	\$30-70	\$6

*SUBSIDISED

HOW TO USE



TECHNOLOGY

BREATH KETONES

- Linear correlation with blood ketones & blood glucose²⁻³
- High sensitivity to breath acetone for diabetes diagnosis⁴



Breath Ketone Indicator

BREATH GLUCOSE

- Linear correlation with blood glucose⁵
- Presence of breath glucose when blood glucose > 6.7 mmol/l



Paper Fluidics

ROADMAP



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 2. Mann-Whitney U-test. C. Corcos. S. Breath acetone as a non-invasive indicator of metabolic status in healthy subjects. The American Journal of Clinical Nutrition. 2002;75(2):43-50.
 3. Srinivasan SR, et al. Prevalence of undiagnosed and previously diagnosed type 2 diabetes mellitus in US youth. Journal of the American Medical Association. 2007;297(22):2802.
 4. Y. Saito, A. Yamada, M. Sakai, M. Hasegawa, C. Liu, and S. Hasegawa. Sensing Technologies for Detection of Acetone in Breath for Diabetes Diagnosis and Monitoring. "Diagnosis" vol. 8, no. 1, 2019.
 5. Y. Saito, A. Yamada, M. Sakai, and S. Hasegawa. "Detection of Acetone in Breath for Diabetes Diagnosis and Monitoring." Clinical Science vol. 156, pp. 527-533, 2019.
 6. H. King and R. Stevens. "Global estimates for prevalence of diabetes mellitus and impaired glucose tolerance in adults." WHO Ad Hoc Diabetes Reporting Group. "Diabetes Care" vol. 16, no. 1, pp. 107-117, 1993.
 7. H. King, A. Linn, S. Srinivasan, P. Mathu, G. Thang, and R. Prager. Diabetes and associated complications in Cambodia. International Diabetes Federation. vol. 184, 2005.