

Investigations					Impact Analysis	Containment & Remediation Planning			Remediation
18 Sep	24 Sep	10 Oct	10 Oct - 29 Nov	29 Nov	29 Nov – 5 Dec	14 Jan	18 Jan	10 Feb	16 Feb
First run of means-test for CHAS performed after system migration	First means-test discrepancy detected by CHAS processing team and reported to NCS	NCS deployment team investigated an unrelated slow performance issue; Software version issue detected was fixed immediately	5 more cases of inaccurate means-test results were eventually detected NCS applications support team investigated since 24 Sep but was unable to pinpoint the root cause	After extensive investigations, NCS confirmed that the root cause of the means-test discrepancies were due to the same software version issue which was fixed on 10 Oct ; MOH informed	MOH and NCS worked together to assess the extent of the impact to individuals On 5 Dec, the extent of impact determined to be thousands of individuals, and schemes besides CHAS	Correct subsidy tiers for each scheme generated; Provided to MOH	Measures implemented to contain impact on non-CHAS schemes	Number of unique individuals affected across all schemes determined	Subsidy tiers of affected individuals fully corrected; Affected individuals to be progressively informed; Reimbursements to commence
<p>System was migrated on 16 Sep. There was a software deployment error in one server. One of the files deployed was not the correct version.</p> <p>Investigation of inaccurate mean test issue</p> <ul style="list-style-type: none"> - NCS' application support team received incident reports of 6 cases of individuals receiving inaccurate subsidies from CHAS processing team - The application support team conducted investigations but was unable to pinpoint the root cause and had thought that it could be a result of intermittent network issue - The investigation was made more difficult as the issue was fixed on 10 Oct - On 29 Nov, after much investigation, analysis and simulation, NCS confirmed that the root cause was due to a software version issue that was fixed on 10 Oct <p>Investigation of slow performance issue</p> <ul style="list-style-type: none"> - On 10 Oct, NCS' deployment team was troubleshooting an unrelated slow performance issue - The team discovered a software version issue which resulted in the failure to retrieve the requisite income information - The issue was fixed immediately - Unknown to the team, while the fix prevented more means-test results being affected, it did not resolve the incorrect means-test results generated before the fix 					<p>Initial Impact Analysis</p> <p>MOH and NCS determined initial impact</p> <ul style="list-style-type: none"> - Developed scripts to extract the list of means-tests that were computed on the affected server from 18 Sep to 10 Oct - Developed programs to simulate the correct subsidies based on initial set of income data to estimate number of individuals and schemes affected - The extent of impact determined to be thousands of individuals and other schemes besides CHAS <p>Detailed Impact Analysis</p> <p>MOH and NCS conducted detailed analysis to determine how <u>each individual</u> was impacted for <u>each scheme</u></p> <ul style="list-style-type: none"> - Developed program to extract actual income information from Sep-Oct - Determined which schemes each individual was affected and whether he/she received higher or lower subsidies than what he/she is eligible for each scheme. 	<p>Containment</p> <p>MOH and NCS corrected the means-test results for individuals whose incorrect records had not been used by other non-CHAS schemes. This helped to contain the impact.</p> <p>Remediation Planning</p> <ul style="list-style-type: none"> - MOH started planning for changes to effect correction of subsidy tiers for remaining individuals - MOH started developing remediation plans with scheme administrators 	<p>Remedial Actions</p> <ul style="list-style-type: none"> - Implemented measures to correct subsidy levels for all affected individuals - Scheme administrators and service providers will start informing affected individuals and arranging for reimbursements 		
<p>For attribution purposes, please attribute Annex A to the Ministry of Health <u>and</u> NCS Pte Ltd.</p>									