

Investigations					Impact Analysis	Containment & Remediation Planning			Remediation
<p>18 Sep</p> <p>First run of means-test for CHAS performed after system migration</p> <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>24 Sep</p> <p>First means-test discrepancy detected by CHAS processing team and reported to NCS</p>	<p>10 Oct</p> <p>NCS deployment team investigated an unrelated slow performance issue; Software version issue detected was fixed immediately</p>	<p>10 Oct - 29 Nov</p> <p>5 more cases of inaccurate means-test results were eventually detected</p> <p>NCS applications support team investigated since 24 Sep but was unable to pinpoint the root cause</p>	<p>29 Nov</p> <p>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</p>	<p>29 Nov – 5 Dec</p> <p>MOH and NCS worked together to assess the extent of the impact to individuals</p> <p>On 5 Dec, the extent of impact determined to be thousands of individuals, and schemes besides CHAS</p>	<p>14 Jan</p> <p>Correct subsidy tiers for each scheme generated; Provided to MOH</p>	<p>18 Jan</p> <p>Measures implemented to contain impact on non-CHAS schemes</p>	<p>10 Feb</p> <p>Number of unique individuals affected across all schemes determined</p>	<p>16 Feb</p> <p>Subsidy tiers of affected individuals fully corrected; Affected individuals to be progressively informed; Reimbursements to commence</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>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>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>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>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. 				

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